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Streptocarpus saxorum 1
A New Source of Seed of Japanese Plants 4
Pelargoniums in Cultivation I 5
Liberty Hyde Bailey, 1858 - 1954 27
Notes on Cultivated Labiates
5. Lavandula 47
Erica Bauera Grown as E. Bowieana 57
A Double-flowered Rosa carolina 58
On the Gender of Scientific Plant Names 59
Errata, Volumes 1 and 2 64

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Streptocarpus saxorum

Harold E. Moore, Jr.

In the East Usambara and Uluguru Mountains of Tanganyika, home of the Saintpaulias or "African Violets," the genus Streptocarpus is represented by several species, among them the most unusual and decorative Streptocarpus saxorum. Originally collected on Lutindi, a mountain peak in the East Usambaras, it was described in 1894 from dried specimens studied by the German botanist Adolph Engler. It belongs in the assemblage of leafy-stemmed tropical species that have been placed together in the subgenus Streptocarpella. Only one or perhaps two species of this sort have been grown in the United States. Streptocarpus Kirkii Hooker filius, with its clusters of miniature blue flowers, is most commonly seen. Streptocarpus nobilis C. B. Clarke is listed but not determined with certainty. A third species was added when plants of an unknown African gesneriad flowered in Ithaca and proved to be Streptocarpus saxorum.

Streptocarpus saxorum was introduced to the United States through the efforts of Mr. Leonard J. Brass who, while collecting African plants for the American Museum of Natural History, stayed for a time, in May, 1950, with Dr. P. J. Greenway at Amani in the East Usambara Mountains. There Dr. Greenway had brought the species into cultivation, from the wild. From this source seeds of two forms were given Mr. Brass. Through Dr. Harold Anthony, Curator of Mammology at the Museum, cuttings of the typical form with solitary flowers were given Mr. Harold Epstein. Mr. Epstein in turn sent material to the Bailey Hortorium for identification and has most kindly supplied background information.

In cultivation, the species is noteworthy for its compact, branched habit, whorls of small, dark-green leaves and profusion of handsome white flowers with a soft, yet bright, lilac limb, each flower being borne on a long peduncle from the axil of a leaf. Under conditions similar to those given Saintpaulia, healthy plants developed from cuttings in less than a year. They began to flower in early December at Ithaca, while companion plants grown by Mr. Paul Arnold at Binghamton, New York, commenced flowering about mid-November. In Africa, the plants known to Engler were collected in flower and fruit during the month of July. Individual flowers last for several days. They are produced one or a few at a time

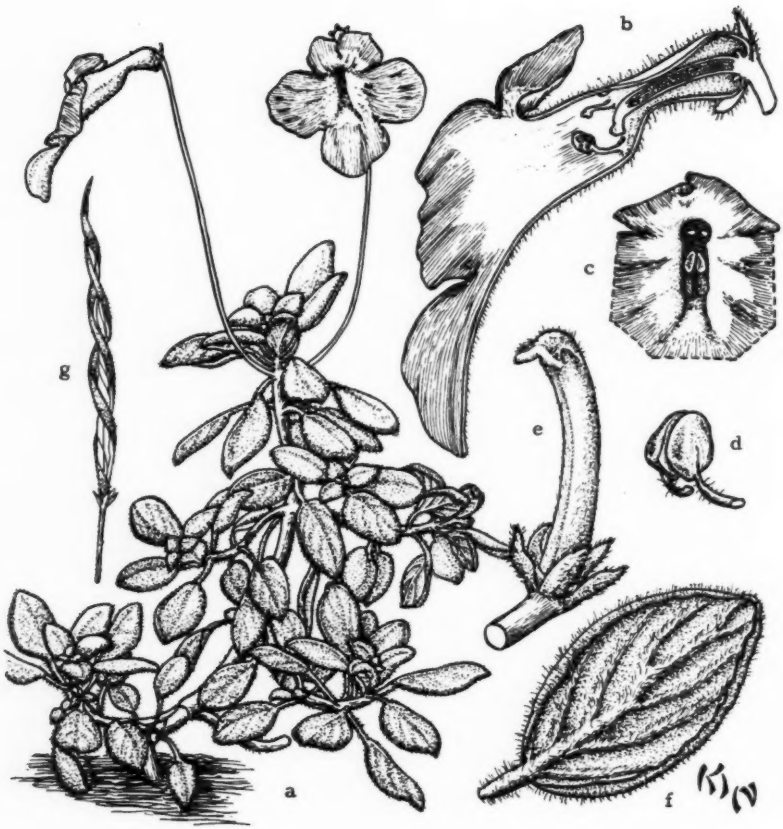


Fig. 1. Streptocarpus saxorum: a, habit x 4/5; b, flower in vertical section x 2; c, outline of throat x 2; d, stamens x 4; e, gynoecium x 4; f, lower side of leaf x 2, all from life; g, fruit x 4/5, redrawn from Engler.

over a relatively long period, for in mid-January buds were still forming in quantity.

Dr. Greenway has given the following information regarding the species in its native home, as quoted from correspondence. "In its natural habitat it grows on gneiss rock faces and crevices fully exposed to the sun for about half the day under a rainfall of 70 in. average annual, a fairly high humidity and a shade temperature ranging from about 55° to 85° F." From other information provided by Dr. Greenway, we learn that the species occurs in several places. In the East Usambara Mountains it is known from Uberi-Mgambo, Mlinga Central Peak, Bomale and Lutindi; in the Uluguru mountains from Morogoro, Lupanga Peak and the north end of the mountains.

Streptocarpus saxorum was illustrated by Engler in "Die Pflanzenwelt Ost-Afrikas," part C, plate 43 (1895), from dried specimens, and there does not show clearly the natural form of the flower. The accompanying drawing (fig. 1) and description have been made from living plants, except for the fruit. Like other species of the subgenus Streptocarpella, S. saxorum has a chromosome complement of 2n = 30. This was reported by Lawrence, Scott-Moncrieff, and Sturgess from root-tips of plants that flowered in England[1]. An independent confirmation was made from flower-buds in January, 1955, by Dr. R. E. Lee of Cornell University who obtained a haploid number of n = 15.

Stems of Streptocarpus saxorum are erect and branching, at first green or pinkish, fleshy, and densely short-hairy, but at length becoming somewhat thicker with brown skin. The small, rather dark-green, elliptic leaves are usually borne in whorls of three at intervals along the stem, the intervals long below, short toward the tip. Each blade is from 1 to 2.5 cm. long, 8 to 15 mm. wide, on a pale petiole 5 to 12 mm. long. The blades and petioles are everywhere covered with a dense coat of very short, fine, pale, erect hairs. On the underside, the blades are pale with 4 (sometimes 5-6) pairs of prominent, almost translucent, raised veins and the margins are turned under so that the leaf appears to be thicker than it is. Single flowers on glabrous or usually thinly hairy peduncles up to 8 cm. long appear in the axils of the upper leaves. The very small calyx consists of 5 ovate-lanceolate, green or red-flushed hairy lobes 3 mm. long, 1 mm. wide, at the base of the densely glandular-hairy white corolla-tube. At the base, the corolla-tube is slender and terete for about 6 mm., then is pouched on the under side and laterally flattened to the spreading limb, the whole tube measuring about 15 mm. on the upper side, 22 mm. on the lower side but sometimes smaller or slightly larger. On the back, the limb is white and hairy, on the front it is smooth and lilac except for a white area around the key-hole-shaped throat.

[1] Journal of Genetics 38: 301 (1939).

The two upper lobes are bent backward and are slightly smaller than the spreading lower lobes; the latter are about 10 mm. long, 12 mm. wide. Ordinarily only the lower 2 stamens develop, but in rare flowers 2 of the 3 staminodes may be similar in appearance to, and almost as large as, the fertile stamens. The short, hairy ovary is tipped with 2 stigmas that bend downward. Mature capsules are about 6 cm. long, according to Engler.

When this attractive Streptocarpus becomes more widely available, it should make an interesting companion plant for "African Violets." The graceful white and lilac flowers are exceptionally attractive and delicate, showing to advantage against the green of the foliage.

A NEW SOURCE OF SEED OF JAPANESE PLANTS

The number of Japanese plants in our gardens is great, but the number of potential garden plants available from the Japanese flora is much greater. A new source for seed of this flora is a Japanese botanist and plant-breeder, Mr. Shigataka Suzuki, whose address is Izumi-761, Komae-machi, Chofu Post Office, Tokyo, Japan.

Mr. Suzuki, born in 1920, is a graduate in horticulture and now teaches botany in a pharmaceutical college. At one time he was a student of the late Prof. Koidzumi. Most of his seeds are collected from native plants growing in the wild, but he clearly indicates cultivated origins in his lists whenever applicable.

The seeds that he offers in his extensive lists are not for sale. They are available in exchange for seeds of plants native in the country of the person receiving his list. He writes, "At present the most interesting groups for us are Ericaceæ and Iridaceæ, but any plants are very necessary...for...my botanical garden in which every section represents the flora of every country." His travels in Japan are supported largely by three large American universities, for which he collects herbarium specimens. Interested botanists may purchase herbarium specimens of Japanese flora from Mr. Suzuki at the rate of $15.00 a hundred, plus packing and shipping costs.

Four seed lists have been issued by Mr. Suzuki during 1954 and seeds have been exchanged with him recently by the Bailey Hortorium.

Pelargoniums in Cultivation. I.

Harold E. Moore, Jr.

Most of us, as children or adults, have had some occasion to become acquainted with one or more of the important kinds of the so-called geraniums, known botanically as Pelargonium. The zonal or fish geraniums, Pelargonium ×hortorum, are familiar house plants in a wide array of color, form and size. Pelargonium ×domesticum is a florist's item in the East but, with the ivy geranium, P. peltatum, grows out-of-doors in the West. Many species or hybrids are grown for their scented leaves and pelargonium fanciers are familiar with a lengthy list of novelties less frequently seen in cultivation.

With few exceptions, the wild species are native in South Africa. In their native habitats they hybridize to some extent, but in cultivation extensive and intensive hybridization, by plan or by chance, has obscured the exact origin of many widely grown pelargoniums, hence the cultivated plants are often difficult to understand. Monographic studies of the wild species have generally been cumbersome and not easy to work with. For these and other reasons, the nomenclature and identity of cultivated pelargoniums have become very confused.

An attempt to clarify some of the major problems has brought to light long-neglected but necessary changes in names. In addition, it has shown that some species have been misidentified in our gardens. From this study, a series of two articles, in four parts, has been prepared, dealing with names, mistaken identities, a key to the cultivated species and better known hybrids, and a discussion of the groups of species, or sections. The first two appear in this issue of "Baileya," to be followed by the third and fourth in the next number.

I. SOME LONG-NEGLECTED NAMES

Nomenclatural difficulties have attended the genus from the outset. The name Pelargonium itself has generally been attributed to the French botanist L'Héritier in a handsome folio of plates entitled simply "Geraniologia." Although this carefully executed work bears the date 1787-1788 on the title-page, it is clear from Britten and

Woodward's study of L'Héritier's botanical works[1] that it probably appeared no earlier than 1791 and can be definitely established only as dating from the middle of 1792. An accompanying manuscript was never published.

Under Articles 47 and 48 of the current International Code of Botanical Nomenclature, the genus Pelargonium cannot be ascribed to the collection of plates in "Geraniologia." It is fortunate, therefore, that valid and legitimate descriptions were published in Aiton's "Hortus Kewensis," vol. 2 (1789). As Britten and Woodward have pointed out, the treatment of Pelargonium in "Hortus Kewensis" was based on brief descriptions included in letters from L'Héritier. In all but two instances, L'Héritier is credited with the species as well as with the genus, and references are given to the then unpublished plates. It would appear, then, that the generic name Pelargonium, along with many specific names, must date from 1789 and that its authorship may be cited as L'Héritier ex Aiton.

After the appearance of "Hortus Kewensis" and "Geraniologia," L'Héritier's genera were widely accepted by other botanists. A notable exception was Henry Andrews. In the "Botanist's Repository" (1797-1811) and "Geraniums" (1805), he or his associates described and illustrated under the generic name Geranium many species that were later placed in Pelargonium by his contemporaries. Prior to Andrews and L'Héritier, another important study was that of Cavanilles, who had a broad concept of Geranium similar to that of Linnæus. Cavanilles devoted the fourth volume of his "Monodelphiæ Classis Dissertationes" (often cited simply as "Dissertationes") to the description and illustration of 128 species, among them many later transferred to Pelargonium.

Of particular importance to the student of Pelargonium are the extensive treatments of Carl Willdenow in the fourth edition of "Species Plantarum," vol. 3 (1800), and in "Enumeratio Plantarum Horti.... Berolinensis" (1809); of C. H. Persoon in "Synopsis Plantarum" (1807); of Friedrich Dietrich in "Die Linneischen Geranien" (1801-1803) and in his "Vollständiges Lexicon der Gärtnerei und Botanik" (1807) with its supplements in 1820 and 1827; of DeCandolle in "Prodromus," vol. 1 (1824); of Robert Sweet in his classic five-volume "Geraniaceæ" (1820-1830); and of Leopold Trattinick in a similar five-volume work, "Neue Arten der Pelargonien" (1825-1831). The most recent comprehensive study is the monograph by R. Knuth in Engler's "Das Pflanzenreich" IV 129 (1912), which supersedes the study of Harvey in "Flora Capensis," vol. 1 (1860).

In these early studies, very many new names were proposed, a large proportion of them for hybrids or other horticultural forms. The same name was also used for different plants in some cases. "Index Kewensis" (1895) listed more than 1400 names in Pelargonium, yet the treatment of Harvey, in "Flora Capensis," allowed

[1] Journal of Botany 43: 271 (1905).

Fig. 2. Geranium citriodorum Cavanilles, redrawn from Cavanilles, Icones 1: pl. 81. Now considered the same as Pelargonium acerifolium.

only 163 species in South Africa, and Knuth considered 232 species for the genus. Since that time about 70 additional species or names have been proposed.

With this plethora of names, lacking "Index Kewensis," and without the guidance of a formalized code of nomenclature, it is little wonder that early students erred occasionally. That some of these errors persist today attests to a lack of care in the preparation of the latest monographic treatment.

It is to be hoped that eventually a monographic study of Pelargonium will be undertaken by some of the South African botanists who are familiar with the behavior of the genus in its area of greatest abundance. In the meantime, an attempt has been made to evaluate the names in current use for species pelargoniums or Latin-named hybrids listed in the United States. Additional problems, such as that devolving from Pelargonium ×divaricatum Dietrich and P. divaricatum (Thunberg) DeCandolle, must remain for the future student.

Pelargonium citriodorum

In lists of scented-leaved pelargoniums, the name Pelargonium citriodorum appears frequently. There are two uses of this name, as Thomas Sprague has pointed out in the "Kew Bulletin" for 1922, page 155, and our garden material should be called Pelargonium × citrosum.

Pelargonium citriodorum (Cavanilles) Martius was based on Geranium citriodorum (fig. 2), illustrated and described by Cavanilles in the first volume of his "Icones et Descriptiones Plantarum" (1791). When Martius transferred Cavanilles' name to Pelargonium in "Plantarum Horti Academici Erlangensis" (1814), it became the first Pelargonium citriodorum. Although considered a synonym, or at least a very similar derivative, of P. acerifolium, it preempts the use of a name commonly applied in gardens to the plant mentioned below.

The usual horticultural material bearing the name P. citriodorum is a hybrid derived from P. crispum and has a long history in cultivation. At the beginning of the 19th century, Henry Andrews illustrated a variety of hybrid garden forms under the name Geranium citriodorum, one of which is illustrated here as fig. 3. Since there was already the different Geranium citriodorum mentioned above, Andrews' name was illegitimate and has no botanical standing. Unfortunately, the name appears to have been widely disseminated along with plants. In "Hortus Breiterianus" (1817), Breiter listed Pelargonium citriodorum without description and cited another name, P. citrosum Voigt, as a synonym. Similar plants must have been grown at Ratisbon (Regensburg) in Bavaria, for in 1828 Schrank gave the first description and used the name Pelargonium citriodorum in the second volume of "Sylloge Plantarum Novarum,"

Fig. 3. Geranium citriodorum Andrews, adapted from Andrews, Geraniums. Now given the name Pelargonium × citrosum.

a work dealing primarily with plants grown at Ratisbon, and published in that city.

This later name cannot be accepted under our present code of botanical nomenclature because it duplicated one already known. In 1922 Sprague, taking the name from Breiter's list, suggested the use of P.×citrosum Voigt to supplant Schrank's P. citriodorum. Although the name must date from Sprague's application of it in 1922, and not from its use as a synonym in 1817, it may be taken up for the P. citriodorum of horticulture.

The situation is further confused due to the uncertainty of identity between today's plants and those of the last century. It would be preferable to use fancy names rather than the poorly defined P. ×citrosum. Although the latter will be listed in "Hortus III," the clone most commonly grown as P. citriodorum will be noted simply as Pelargonium 'Prince of Orange'.

In summary, then:

P. citriodorum (Cavanilles) Martius is a synonym of the earlier P. acerifolium L'Héritier ex Aiton, a species not certainly known in cultivation in the United States.

P. ×citrosum Voigt ex Sprague should replace the name P. citriodorum Schrank of horticulture, or the clones believed to be of this alliance may be listed simply by their fancy names, such as Pelargonium 'Prince of Orange'.

Pelargonium cordifolium

In the third printing of "Geraniums" by Helen Van Pelt Wilson (1950), Pelargonium cordatum is listed on page 190 as a rediscovery in American horticulture. As yet the species has not been much listed and growers intending to offer it for sale will find that it should bear the earlier name P. cordifolium.

Cavanilles described Geranium cordifolium as one of many species in his "Dissertationes," mentioned previously. His illustration is redrawn here as fig. 4. It was published in 1787 but, for some reason not stated, in "Hortus Kewensis" (1789) was given the new name Pelargonium cordatum.

William Curtis recognized the priority of Cavanilles' name when he figured the species as Pelargonium cordifolium in his "[Curtis's] Botanical Magazine," vol. 5, plate 165 (1791). The name that should be used today is Pelargonium cordifolium (Cavanilles) Curtis, not the synonym P. cordatum Aiton.

Pelargonium echinatum and P. crassicaule

A striking novelty because of its stems, covered with persistent spiny stipules, Pelargonium echinatum is no stranger to pelar-

gonium enthusiasts in the United States. In cultivation and in the wild state there are plants with white flowers and plants with colored flowers, in some instances both appearing in different inflorescences on the same plant.

The species appears to have been described independently by two writers within a year of each other, each using the same specific epithet. Thunberg called it Geranium echinatum in his "Prodromus Plantarum Capensium" (1794). William Curtis called it Pelargonium echinatum in the "[Curtis's] Botanical Magazine," vol. 9, plate 309 (1795) (here adapted as fig. 5), with no mention of Thunberg whatsoever. Through this strange coincidence, Thunberg's earlier name cannot be transferred to Pelargonium since it would duplicate Curtis' name, nor was it transferred by Curtis as Knuth suggests in his monograph. The species is properly cited as Pelargonium echinatum Curtis.

Curtis illustrated and described the white-flowered form (sometimes called "Sweetheart Geranium" because of the two red, heart-shaped spots on the upper petals), but mentioned in passing that it varied with petals of a rich purple color. Through misinterpretation, Knuth considered the purple-flowered form typical of the species and published a varietal name, proposed by Rudolph Schlechter for the white-flowered form, as P. echinatum var. albiflorum. This name is a synonym for the typical color-form of the species and should not be used. Because both white and purple flowers some-

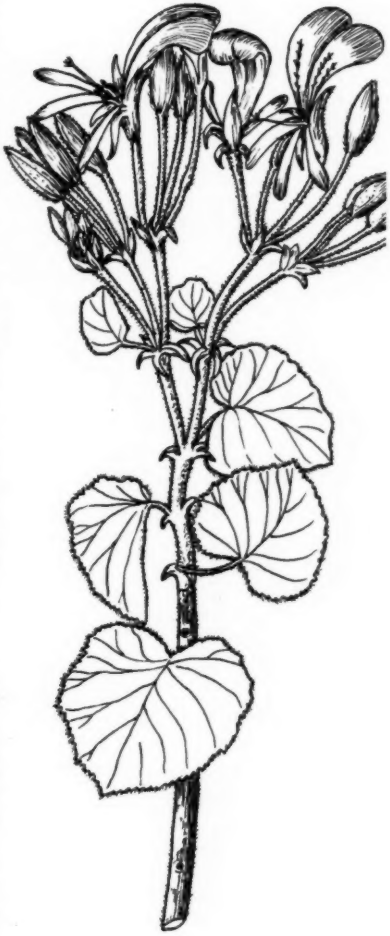


Fig. 4. Pelargonium cordifolium, redrawn from plate of Geranium cordifolium in Cavanilles, Dissertationes, pl. 117, fig. 3.

Fig. 5. Pelargonium echinatum, adapted from [Curtis's] Botanical Magazine 9: pl. 309.

times appear on the same plant, it is obvious that the two forms do not represent true botanical varieties and, if the colored form is designated at all, a fancy name would be preferable.

A similar circumstance occurs in Pelargonium crassicaule L'Héritier ex Aiton, in which the flowers are sometimes spotted only on the two upper petals, sometimes on all five petals. L'Héritier illustrated the first or two-spotted form (fig. 6), to which Sweet gave the name var. album in "Geraniaceæ," vol. 2, plate 192. If distinguished by name, this variety must now be called var. crassicaule, repeating the epithet of the species itself, but the

five-spotted form can be properly designated as var. maculatum Sweet. Since it is probably not a good botanical variety, it is even better designated as a cultivar, P. crassicaule 'Maculatum'.

Pelargonium grandiflorum and P. glaucum

There are six listings of Geranium grandiflorum in "Index Kewensis" and, of these, only one, G. grandiflorum Linnæus, is legitimate. It is unfortunate, therefore, to find that Pelargonium grandiflorum was based on the illegitimately named Geranium grandiflorum described and illustrated by Andrews in the "Botanist's Repository," plate 12 (1798) (fig. 7).

On the other hand, it is fortunate to find that an "escape clause" in the International Code of Botanical Nomenclature provides a means of retaining the familiar name. Article 81 states, "When a new name is required, an author may, if he wishes, adopt an epi-

Fig. 6. Pelargonium crassicaule, adapted from L'Héritier, Geraniologia, pl. 26.

Fig. 7. Pelargonium grandiflorum, adapted from plate of Geranium grandiflorum in The Botanist's Repository, pl. 12.

thet previously given to the taxon in an illegitimate combination, if there is no obstacle to its employment in the new position or sense; the epithet in the resultant combination is treated as new."

When Willdenow placed Andrews' species in Pelargonium, on page 674 of the third volume of "Species Plantarum" (1800), there was no other name available nor was there another P. grandiflorum to make the transfer impossible. The provisions of Article 81 apply here and the name may be retained but should be cited simply as though it originated with Willdenow, i.e., Pelargonium grandiflorum Willdenow.

A species once popular in England and Europe, but no longer grown, may retain its name in similar fashion, should it be reintroduced. Pelargonium glaucum L'Héritier ex Aiton is the same as Geranium glaucum of Linnæus filius, published in his "Supplementum," page 316 (1781). Because Linnæus' G. glaucum appeared later than Geranium glaucum of Burman filius, it is illegitimate. L'Héritier's Pelargonium glaucum, however, used for Linnæus' plant, is considered a new name. In no way can we use the combination P. glaucum (Burman filius) L'Héritier made by Knuth in his monograph. The plant illustrated and described by Burman, in "Specimen Botanicum de Geraniis," page 47, plate 1, fig. 62 (1759), is a stemless, tuberous-rooted species quite unlike that known to L'Héritier and Linnæus and it is difficult to understand why Knuth considered them the same.

Pelargonium graveolens and P. terebinthinaceum

Occasionally the name Pelargonium terebinthinaceum appears in catalogues, where it is often used for a clone of the rose geranium, Pelargonium graveolens L'Héritier ex Aiton, called 'Little Gem'.

Under ordinary circumstances this would be the proper name for Pelargonium graveolens (fig. 8) because the basis for it, Geranium terebinthinaceum of Cavanilles, appeared in his "Dissertationes" (1787) two years before L'Héritier's better known name and therefore has priority.

Fortunately, the familiar name of our rose geranium does not have to be abandoned. Cavanilles' Geranium terebinthinaceum (fig. 9) was a duplicate, therefore illegitimate, name and cannot be used, for J. A. Murray, in the "Commentationes" of the Gesellschaft der Wissenschaften zu Göttingen, vol. 7, page 88, plate 4 (1785), had already used Geranium terebinthinaceum (fig. 10) for the plant we know as Pelargonium quercifolium.

According to Knuth (page 493), both plants called Geranium terebinthinaceum represented hybrids between P. graveolens and

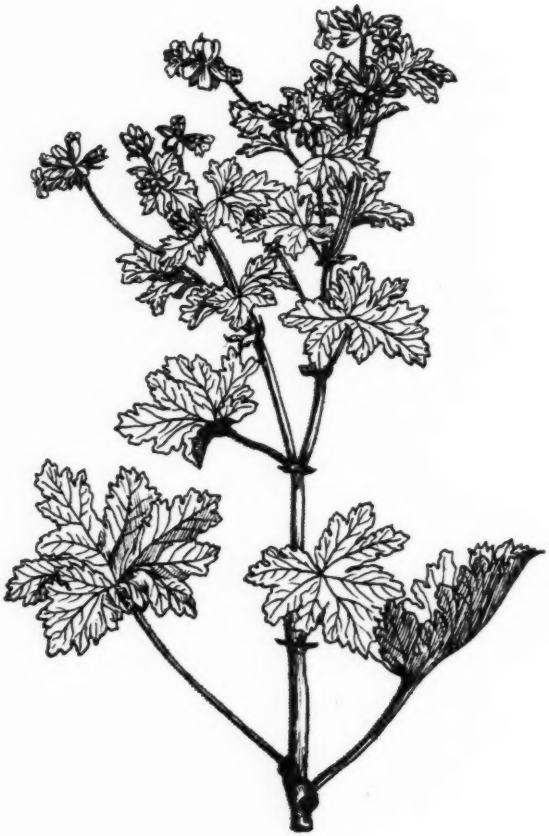


Fig. 8. Pelargonium graveolens, adapted from L'Héritier, Geraniologia, pl. 17.

P. quercifolium, but study of the various illustrations and descriptions does not bear out this conclusion. In neither case does the name replace an established name, and Pelargonium terebinthinaceum should be dropped. The synonymy, then, is as follows:

Pelargonium graveolens L'Héritier ex Aiton, Hortus Kewensis 423 (1789).

Geranium terebinthinaceum [terebenthinaceum] Cavanilles, Monadelphiæ Classis Dissertationes 4: 250, pl. 114, fig. 1 (1787), not Geranium terebinthinaceum Murray (1785).
Pelargonium terebinthinaceum (Cavanilles) Small, in North American Flora 25: 24 (1907).

Pelargonium præmorsum

Plants of an attractive, freely seeding, almost weedy pelargonium grown in a private collection in the United States have been identified with Pelargonium quinatum Sims. This name first appeared in "Curtis's Botanical Magazine," vol. 15, in conjunction with a colored plate (t. 547) dated January 1, 1802. Sims mentioned Geranium præmorsum of the "Botanist's Repository" as a synonym, indicating that the plant had already been named. Sims' anti-

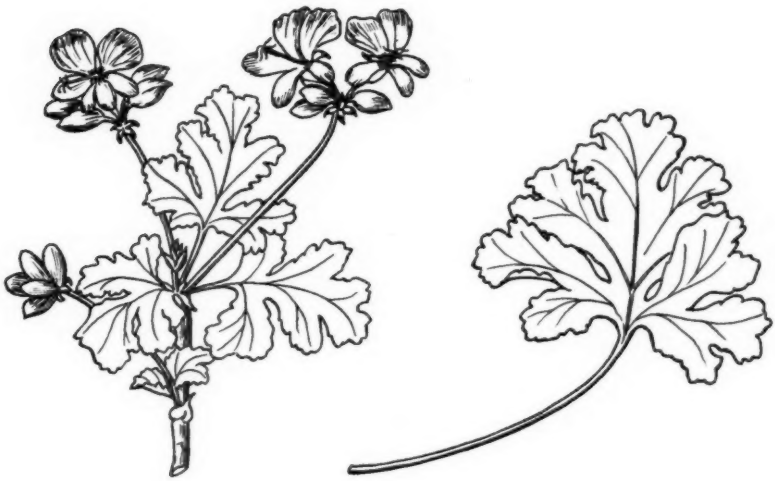


Fig. 9. Geranium terebinthinaceum Cavanilles, redrawn from Cavanilles, Dissertationes, pl. 114, fig. 1. Now considered the same as Pelargonium graveolens.

Fig. 10. Geranium terebinthinaceum Murray, adapted from the original. Now considered the same as Pelargonium quercifolium.

pathy toward Andrews[1], who edited the "Botanist's Repository," was evident in his remarks in the text accompanying the plate of P. quinatum and his opinion of the man apparently caused him to reject the earlier name for reasons unacceptable today.

Reference to plate 150 of the "Botanist's Repository" published by Andrews in April, 1801, shows an excellent likeness of the plant, including details of the flower (fig. 11). The specific name præmorsum, therefore, has priority over the name quinatum. It was transferred to Pelargonium by Friedrich Dietrich in his "Lexicon der Gärtnerei und Botanik," vol. 7, page 48 (1807), a transfer overlooked by the compilers of "Index Kewensis."

The correct name for the species once grown as P. quinatum Sims, and so listed by both Harvey and Knuth, is Pelargonium præmorsum (Andrews) Dietrich.

Pelargonium Radula and P. radens

A distressing situation arises with regard to the name of Pelargonium Radula, a species long known as such in gardens and in commerce. According to the International Code of Botanical Nomenclature, a name is illegitimate and must be rejected if it was nomenclaturally superfluous when published or if the earliest legitimate epithet was not adopted (Article 73). Study of the history of P. Radula shows the name to be illegitimate and it therefore must be replaced with another.

When Cavanilles described the species in the fourth volume of his "Dissertationes" (1787) as Geranium Radula (fig. 12A), he cited as a synonym the slightly earlier Geranium revolutum Jacquin (fig. 12B). His description and plate were not significantly different from those of Jacquin and by our modern standards he should have taken up the name Geranium revolutum instead of proposing a new one. The name Geranium Radula, therefore, is illegitimate since it was superfluous when published. To further confuse the issue, a second and different Geranium Radula (discussed under P. × asperum on page 24 of this article) was proposed in the same year by the German botanist A. W. Roth.

Two years later, when Pelargonium was established in "Hortus Kewensis," the later and illegitimate name of Cavanilles rather than Jacquin's G. revolutum was transferred, so that Pelargonium Radula (Cavanilles) L'Héritier ex Aiton was also illegitimate. The slightly later P. multifidum Salisbury, of the "Prodromus" (1796), was cited as a synonym of P. Radula by Knuth and must also be rejected since Salisbury, too, failed to take up the earliest epithet, which he listed as a synonym instead.

[1] Discussed by Britten in a note on Henry Andrews and his "The Botanist's Repository"; Journal of Botany 54: 236-246 (1916).

Fig. 11. Pelargonium præmorsum, adapted from plate of Geranium præmorsum in The Botanist's Repository, pl. 150.

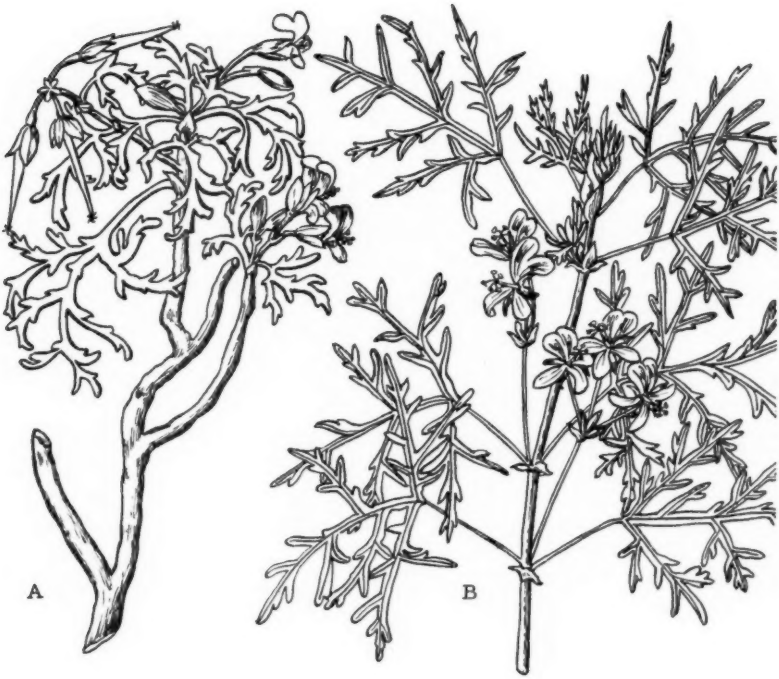


Fig. 12. Pelargonium radens: A, redrawn from plate of Geranium Radula in Cavanilles, Dissertationes, pl. 101, fig. 1; B, adapted from plate of Geranium revolutum in Jacquin, Icones Plantarum Rariorum, pl. 133.

It is now too late to transfer Geranium revolutum Jacquin to Pelargonium, for the name P. revolutum Persoon (based on the illegitimate Geranium revolutum Andrews), published in "Synopsis Plantarum" (1807), applied to a quite different plant and would make the transfer duplicate and illegitimate again.

Because of its distinctive character and its long familiarity to gardeners as P. Radula, finding a substitute name becomes a problem. "Index Kewensis" lists two names as referable to P. Radula. Investigation reveals that neither is usable. One, Pelargonium rosodorum Hoffmannsegg, is actually a name used for P. Radula variety roseum and is therefore a synonym of P. × asperum (page 25).

The second name, P. raduloides Hoffmannsegg ex Dietrich, "Nachtrage zum Lexicon," vol. 6, page 70 (1820), is little more than a name and its application is not precise. Of it, Dietrich wrote (translated in full):

> Pelargonium raduloides Hoffms. Herb. (P. Radula Angl.) Perhaps only a variety of P. Radula which is present in some gardens under the name P. bipinnatifidum or recurvum.

It cannot be determined from the cryptic synonym whether P. raduloides was meant for the P. Radula of "Hortus Kewensis" or, as is more likely, for a different plant grown under that name in English gardens. Hoffmannsegg, himself, in "Verzeichniss der Pflanzenkulturen" (1824), lists both P. Radula and P. raduloides on page 95, showing that he did not consider them the same. The likelihood is good that P. raduloides represented only a garden variant or hybrid derived from P. Radula, but it was based on a fragmentary specimen unlikely to be in existence now. Therefore, it seems inadvisable to take up this dubious name.

A search has revealed no other name and it becomes necessary to propose the following new name for this familiar species:

Pelargonium radens H. E. Moore

> Geranium revolutum Jacquin, Collectanea 1: 84 (1786) and Icones Plantarum Rariorum 1: pl. 133 (1787?), not Pelargonium revolutum Persoon, Synopsis Plantarum 2: 226 (1877).
> Geranium Radula Cavanilles, Monodelphiæ Classis Dissertationes 4: 262, pl. 101, fig. 1 (1787) - illegitimate name, not G. Radula Roth (1787).
> Pelargonium Radula (Cavanilles) L'Héritier ex Aiton, Hortus Kewensis 2: 423 (1789) - illegitimate name.
> Pelargonium multifidum Salisbury, Prodromus 313 (1796) - illegitimate name.

Pelargonium roseum and P. × asperum

Pelargonium roseum is a name long applied to plants apparently of hybrid origin, grown extensively in the Mediterranean region as a source of a volatile oil used in perfumery and occasionally listed in foreign catalogues.

Its origin can apparently be traced back to 1800 when Willdenow described a hybrid between P. graveolens and P. Radula [P. radens] as P. Radula variety roseum Willdenow. Although attributed to Willdenow as a species, in Sprengel's "Nomenclator" (1821), in Ecklon and Zeyher's "Enumeratio Plantarum" (1835), and in "Index Kewensis" (1895), it is apparent that Willdenow had no such concept, for he was explicit in discussing the hybrid, of which he said (here translated), "In variety β [roseum] which differs in

Fig. 13. Pelargonium × asperum, adapted from the original plate of Geranium Radula Roth.

broader and shorter teeth, the odor is exactly that of Rosa centifolia."

Pelargonium roseum Willdenow ex Sprengel must be abandoned because of an earlier use of the name applied to a different hybrid. The earlier name is Pelargonium roseum Ehrhart, published in the seventh volume of his "Beitrage zur Naturkunde" (1792). On page 537 of his monograph in "Das Pflanzenreich," R. Knuth refers to this, and to a third P. roseum mentioned below, as hybrids of undetermined parentage, but Ehrhart's name is valid and takes priority in any event. According to Willdenow, in "Species Plantarum" ed. 4, vol. 3, page 667 (1800), it is a form of P. × hybridum which he called P. × hybridum var. roseum (Ehrhart) Willdenow.

Second to bear the epithet roseum in a specific sense is a species or hybrid originally illustrated by Andrews as Geranium roseum in the "Botanist's Repository," plate 173 (1801), and transferred to Pelargonium in the second edition of "Hortus Kewensis" (1812) as Pelargonium roseum (Andrews) Aiton filius. If this is rediscovered in the wild, it should bear the substitute name P. condensatum Persoon, proposed in "Synopsis Plantarum" (1807).

It is obvious, then, that the name Pelargonium roseum is incorrect when used for the hybrid P. graveolens × P. radens, and our present concepts do not encourage the use of a varietal name such as var. roseum for an interspecific hybrid. Although Knuth used a formula in his monograph, page 493, a "specific" name is more practical for the general horticulturist, pharmacist, etc., and to supply this the name P. × asperum Ehrhart ex Willdenow is suggested for consideration.

When first published in the fourth edition of "Species Plantarum" (1800), Pelargonium asperum was not considered a hybrid, but examination of the basis for the name suggests strongly that it actually was such. It was proposed as a substitute for the name Geranium Radula (fig. 13) published independently by Albrecht Wilhelm Roth in his "Botanische Abhandlungen und Beobachtungen" (1787). A look at the handsome plate in Roth's book shows clearly that this is not the Geranium Radula of Cavanilles, published in the same year and discussed as P. radens on pages 19 to 22.

Instead, it resembles P. graveolens but differs in having leaves with narrower, more deeply cut segments, and harsh hairs showing characteristics almost surely inherited from P. radens. Specimens in cultivation today and considered to represent hybrids between P. graveolens and P. radens agree well with the plate.

Although any interpretation of P. × asperum must be based on assumptions, it seems reasonable to consider the name applicable to hybrids between the two species mentioned, and such a course is suggested to provide a method of referring to plants of this parentage now lacking a usable name. Hybrids of this category are by no means uniform, but under our present code all must bear the

same "specific" epithet with particular variants designated by fancy names where desired. It is probable that a careful study of fancy-named cultivars of P. graveolens will show that some of them belong here. The detailed synonymy follows:

Pelargonium × asperum Ehrhart ex Willdenow, Species Plantarum, 4th edition, 3: 678 (1800); as a species. [P. graveolens × P. radens]

Geranium Radula Roth, Botanische Abhandlungen und Beobachten 51, pl. 10, 12, fig. 9-16 (1787), not Geranium Radula Cavanilles (1787).

Pelargonium Radula variety roseum Willdenow, Species Plantarum, 4th edition 3: 679 (1800).

Pelargonium roseum Willdenow ex Sprengel, Nomenclator Botanicus 602 (1821), not P. roseum Ehrhart (1792) nor P. roseum (Andrews) Aiton filius (1812).

Pelargonium rosodorum Hoffmansegg, Verzeichniss der Pflanzenkulturen 95 (1824).

That the plants used commercially for pelargonium oil are not uniform is indicated by Richard Knuth in the "American Journal of Pharmacy" for May, 1921 (p. 302). According to him, the rose geranium of Algeria and the Isle of Reunion, although called P. capitatum, is actually derived from P. graveolens, while P. radens is grown in France. His illustration of the rose geranium shows a plant very similar to P. × asperum. A name, Pelargonium Krappeanum, was proposed by him but was not accompanied by a description nor is the parentage clearly indicated, so it cannot be considered valid. The whole complex of oil-producing species and hybrids needs further study.

II. SOME MISTAKEN IDENTITIES

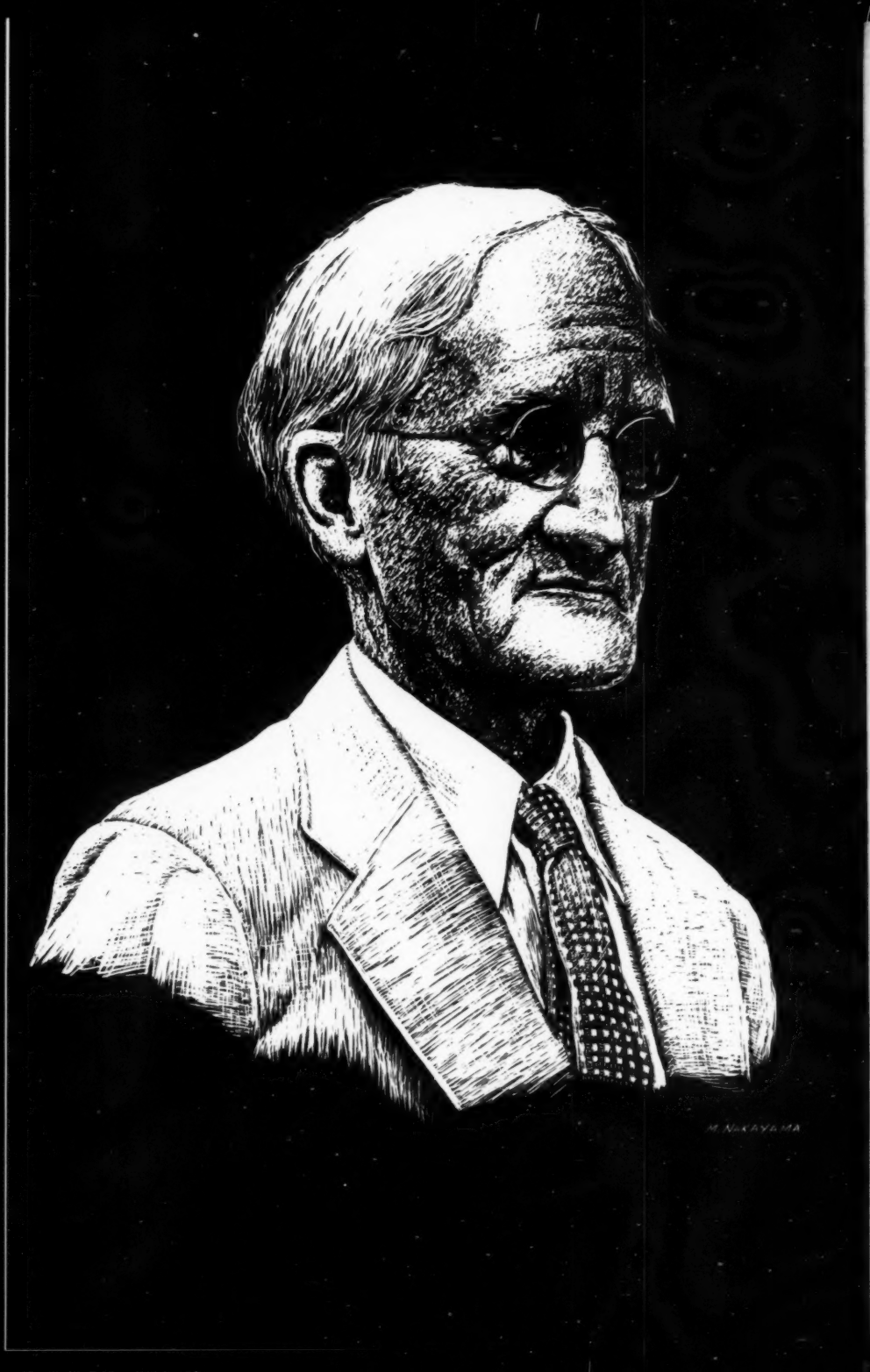
Even when provided with a usable name, it is also necessary to be sure that plants in cultivation are really the ones that should bear it. In the course of time, perfectly good names have become attached to the wrong plants. Instances of this sort that have become apparent during studies for "Hortus III" are elaborated here.

P. parviflorum and P. grossularioides

A truly complicated mix-up in names centers about the two species P. parviflorum and P. grossularioides. Both names appear in current catalogues, and usually for the wrong plants.

The true Pelargonium parviflorum Wendland is a species with gnarled, succulent stems, pinnate leaves, and slender white petals about 1 cm. long, the upper two being splotched with rose. It is unknown in cultivation here, and in any event should be given the

(continued on page 41)


M. NAKAYAMA

Liberty Hyde Bailey, 1858 - 1954

George H. M. Lawrence

Liberty Hyde Bailey died at his home late in the evening of Christmas day, 1954. He was ninety-six years old. For the most part, accounts about him reflect the restricted interests of the organization in whose journal the notice appears. But he was not a man of restricted interests. The scope of his accomplishments far exceeds that of this journal of horticultural taxonomy. Nonetheless, it is appropriate that the institution bearing his name, the Liberty Hyde Bailey Hortorium, bring to all who are interested in the man a balanced appreciation and a nucleus of documentation representative of his record. It is fitting that this be published in *Baileya*.

The record of his contributions is ample evidence that Dean Bailey was a great man. A part of this greatness is owed to his inheritance, a part to the environment of his youth, and another to the era in which he flourished. His father, Liberty Hyde Bailey, Sr., was a Vermonter who went west to Michigan in his twenties. He was a Puritan, a Congregationalist who knew his Bible and feared his God, a farmer and fruit-grower extraordinary, a Mason and member of the Grand Masonic Lodge of his state. He was a leader in his community. He was renowned for his forthrightness of speech, for his directness of action, and for the unimpeachable integrity of his word. This father's influence on his son was increased by the death of the young Bailey's mother, very early in his childhood. The repeated admonitions of the father, ever exemplified by his own living, of the necessity to be honest, to stand upright as you walk and as you live, to have a purpose in what you do, and to do good about you, formed a core of maxims never forgotten by Dr. Bailey and which were reflected throughout his activities.

Bailey was a precocious son of the wilderness. Through his boyhood he traversed the forests about his father's farm and learned early the ways of wild-life, of the plants and animals that composed it. He knew the migrant Indians, watched the slaughter of the passenger pigeon, and practiced the art of rail-splitting. His early knowledge of literature was limited, but being an avid reader, he knew well the Bible, Bunyan's *Pilgrim's Progress,* Milton's poems, Baker's *Explorations of the Nile Tributaries of Abyssinia,* and Darwin's *On the Origin of Species,* to mention a few. The writings of Downing on pomology were also known to him and the first book he knew of botany was one by Asa Gray. There is no doubt that much is owed to two teachers of his country-school days; teachers from whom he received the only formal instruction he ever had in grammar, Latin, and geometry; teachers from whose one-room school he entered directly into college, for he never went to high school. From this background he became a leader in college life. Academically he stood at the top of his class, and as the first editor of the *College Speculum* he was prominent in directing the thinking of his fellow students.

In his ninety-six years, Liberty Hyde Bailey made his mark not only as a horticulturist, botanist, and administrator, but also as an editor, rural sociologist, poet, and philosopher. Activities in these fields were often concurrent and no small part of his greatness lay in his capacity to be productive in several of them at the same time.

Bailey was a horticulturist by birthright and upbringing. His greatest activities in this field were during the last two decades of the nineteenth century—a time of great expansion in this country, when botanical research in the field of plant physiology had scarcely commenced and the pathology of plants was little known. It was a time when there was no horticultural literature based on research such as is known today, and a time when much of the existing literature was imported or adapted from that produced across the Atlantic. It was a period when few if any horticulturists had received formal instruction in botany, and a period when sympathy from the botanist for the horticulturist's needs was conspicuously absent. Trained in botany under Beal at the Michigan Agricultural College and later associated with Asa Gray at Harvard, Bailey early was imbued with the conviction that horticulture must reflect the application of basic botanical knowledge.

After he came to Cornell from Michigan in 1888, Bailey's early horticultural papers dealt with physiological aspects of growth under electric lights (the first research of this kind in America), the physiology of seed germination and its relation to quality of commercial seed packets, and the value of carbon dioxide as a growth-promoter of greenhouse crops. Unsuccessful in soliciting aid from Cornell mycologists toward resolving problems of grape diseases, he hired H. H. Whetzel, a young mycologist at Cornell, to head up research in plant diseases in the College of Agriculture, applying mycology to the needs of New York grape growers. During his first decade at Cornell, Bailey wrote twelve books on horticultural subjects, excluding those on plant-breeding and genetics, and during the last years of this decade he planned and commenced his first horticultural encyclopedia. Bailey dominated the American field of horticultural books during this period. Through his books, lectures, and articles he preached and practiced a new horticulture. He held the conviction that horticulture must be an applied science based on pure biology, just as engineering was then accepted as an applied science based on the theoretical sciences of mathematics, physics, and chemistry. This innovation was unacceptable to some natural scientists, and this concept of horticulture has reached its present predominance largely by the dogged persistence and crusading of Bailey and his supporters. His founding, with S. A. Beach of the Geneva (N. Y.) Experiment Station, of the American Society for Horticultural Science in 1903, and his serving as its President for its first four years, did much to organize and bring recognition to a growing group of botanists that had become horticulturists.

The initial training of Bailey as a botanist was further influenced by his intimate but brief travels in Michigan with the world-famous

British naturalist, Alfred Russel Wallace, Bailey at that time a young professor and Wallace in the autumn of his life. There were two developments from this background. One was Bailey the evolutionist and plant-breeder, active in an era before there was knowledge of genes or genetics; the second was Bailey the taxonomist, author, before coming to Cornell, of papers on the flora of Michigan and speciation in Carex. As a plant-breeder, Bailey was an experimentalist, who made controlled crosses and kept accurate records, not only of his crosses but by placing in the herbarium vouchers of the plants concerned. It was his breeding researches in bramble-fruits, cucurbits, and grapes that led him in later years to intensive taxonomic studies of these genera. Four different books of his authorship were published on the subject before the turn of the century. De Vries acknowledged that it was the citation of Mendel's original work in a bibliography compiled and published by Bailey in 1892 that led to his rediscovery of those basic laws of inheritance. In 1907 Bailey established at the College of Agriculture at Cornell a Department of Experimental Plant Biology headed by H. J. Webber, as a genetical research division that later became the Department of Plant Breeding.

In his middle years, Dr. Bailey was very active in the effort to bring the science of botany before students at the secondary school level. Six botany text-books were written by him between 1898 and 1909. In fact, one of his first books, *Talks Afield,* published in 1886, was a book of botany written for the understanding of the farmer, horticulturist, and non-scientist. These text-books were written not for lack of something better to do, but because of the lack of acceptable botanical texts for high school courses.

Bailey's principal contributions to botanical science were his taxonomic studies, contributions for which his academic training well equipped him. In 1886 he was a member of a botanical survey-party in Minnesota, working with J. C. Arthur, a mycologist and later an authority on rust diseases of plants. For several decades in middle life Bailey was an acknowledged authority on the American sedges (Carex) and his photographing of type specimens in European herbaria in 1888 was pioneer work of that nature. His paper on this work (in volume 1 of *Memoirs of the Torrey Botanical Club*) was one of a series of eighteen papers devoted to the genus. One of them was a synopsis of all species then known from Greenland to Alaska and south to Panama. His first Carex study was published in 1884, his last in 1900.

Following his Carex studies and a few early papers on the systematics of cultivated blackberries, over two decades passed before he was able to resume the taxonomic work for which he became so well known in the last quarter-century of his life. From 1923 to 1949 he published over one hundred scientific papers. These were mostly extended papers, concerning revisions of genera. His program for this work was planned from the beginning. The plan included the founding of a new periodical, *Gentes Herbarum,* that continues today, and the establishment of a

new type of research institution, later named the L. H. Bailey Hortorium. There was reason for the founding of a new periodical and a new type of research institution. Bailey's taxonomic work of this period was new and, to some, unconventional, for it represented the application of the procedures, employed by all taxonomic botanists, to the solving of problems of identity, classification, and nomenclature among cultivated plants. For each genus studied, he first sought to know and to document the taxonomic status of its members as they are found native, or in the wild, and then to use this knowledge in evaluating situations among the cultivated members. Bailey became a specialist in the systematics of the palms and the blackberries. He also published revisions of such genera as Vitis (the grapes), Brassica (the cabbages and kales), Cucurbita (the pumpkins, squashes), Hosta (the plantain-lilies), and horticultural monographs of lesser botanical import on Dianthus, Delphinium, Campanula, and the gourds.

His renowned interest and work in the palms is alleged to have had its beginning in an occasion in 1910 when Mrs. Bailey teased him while they were in Jamaica, for not knowing the kinds of palms in the gardens of Kingston. His collections of palms began in 1917, and extensive trips for this purpose were made for many years before he wrote his first paper on them in 1930. He demonstrated the importance of adequate herbarium collections, augmented by photographs, and he lived to see his palm herbarium become one of the best in the world. His studies of Rubus in North America covered a life-time of effort and culminated in a thousand-page monograph of the genus, completed in 1945. To this he added two substantial supplements, one in 1947 and one in 1949. It is the only work of its kind for the genus in this hemisphere, and serves as a monument to his endeavor. His herbarium collections in Rubus date back to 1880, number in excess of 33,000 specimens, and are acknowledged to be the finest, as well as the largest, anywhere.

The majority of readers of *Baileya* are horticulturists or botanists and are more or less familiar with these accomplishments of Bailey. No one can deny that Liberty Hyde Bailey was a great man, but his greatness was due as much to accomplishments in other fields as to those recounted above. To appreciate the man fully one must know the scope of his impact.

For a generation he was remembered as a great teacher, of the 1880's and 1890's, but as he outlived his students, and many of the next generation also, his reputation in this field became less general. Nevertheless he had exerted an influence not only on his students but on the hundreds of persons who in turn became pupils under them. As a teacher he not only carried his zest and vigor to the classroom, but he changed the approach and emphasis in teaching. Whereas he had found it to consist of a formal lecture augmented literally by formal parades to visit and view the activities of the university farm conducted by hired hands and foremen, he rejected this routine and substituted for it the laboratories, inside and outdoors, where the professor mixed

with his students while demonstrating a principle or setting up a planned experiment in which they took part. Today, this is commonplace in American universities. Sixty years ago, it caused comment and some consternation. Bailey lectured before educators on the merits of his teaching procedures, defended from the rostrum and through the press the teaching of agriculture as a science, and its place as a technology at the graduate level in a university. His opponents were not only the New York farmer who feared his son might come home from the College unwilling to shed his bowler and white collar or to soil his hands, but also an appreciable segment of the Cornell administration and faculty who resisted the "Cow College," who would discourage its students from participating in university sports, who denied even the need of a piano for student activities in the College of Agriculture, and who refused to grant advanced degrees in agricultural subjects.

Bailey's activities resulting in the establishment of agricultural subjects on a level with other academic subjects brought him into prominence as a leader in agricultural administrative matters. On the retirement of Isaac P. Roberts in 1903, he became the second Director of the College of Agriculture, then still a part of Cornell University and financed by the University (whose funds for the College were supplemented by federal monies). Long before this, however, he had been active throughout the state. For a decade he organized and worked for the day when Cornell's College of Agriculture should be financially free from the University and become the New York State College of Agriculture at Cornell University. The accomplishment of this goal would shift to the state the responsibility for expansion and support of the College, a support Bailey could encourage more effectively over the years through the state's farm population and through state and federal legislation than anyone could through the more limited financial resources available to the University. Following a vigorous legislative struggle, where surprisingly enough most of the opposition came from seven other universities of the state, Bailey proudly saw the founding of a State College of Agriculture at Cornell in May 1904; a college with himself as Dean of its Faculty, Director of the College and its Experiment Station, and Professor of Rural Economy. For the next decade his major contributions were those of an administrator. It was during this period that, for political reasons, he divided horticulture into three different departments. One he called Experimental Plant Biology but later coined for it the new name of Plant Breeding. Earlier he had established a Department of Plant Pathology. Ornamental Horticulture remained a department by itself. A department of Plant Physiology was created which, early in 1913, Bailey expanded into a balanced Department of Botany, with K. M. Wiegand at its head. This was a move that resulted in the existence, for several years, of two botany departments in the University. Following his change of the name domestic economics to home economics, there was his successful struggle in 1912 to get University faculty approval for his

promotion of a woman, for the first time in Cornell history, to the rank of full professor (in home economics). The Department of Home Economics within the College of Agriculture he had established in 1907.

As an administrator he was a leader in New York state in the establishment of agricultural extension courses for men and women on the farm. This was many years before federal support was authorized for the work and before it became national in scope. Many years were required by him to convince state officials that agricultural courses taught in high schools throughout urban and rural New York state should be accepted by the Board of Regents and given equal academic recognition with other high school subjects. This recognition was announced in 1905. Two years later the College of Agriculture voted to accept agriculture as an entrance subject, thus placing vocational agricultural work on a par with other entrance subjects. Nature-study as a subject in grammar schools received great impetus from his administrative support, making Cornell's State College of Agriculture the center of the work. Not only did he found a series of bulletins and leaflets published by the College that served as teaching media in this field, but he lectured across the country and wrote books on its role in the community.

In 1908 he accepted President Roosevelt's invitation to act as chairman of the Commission on Country Life in America. The report of the nation-wide survey made by the Commission resulted in subsequent establishment of the U. S. Parcel Post system, a nationwide federal extension service, agricultural education of national scope in public high schools, and the federal support of rural electrification programs and communication facilities to rural areas.

Early in his career Bailey announced his plan of life, wherein he proposed to divide it into three parts and to spend twenty-five years in preparation, twenty-five in earning a livelihood, and twenty-five in using his abilities as he chose. This was no idle pronouncement on his part, although taken lightly or discounted by most associates outside his family. If adhered to, it meant retiring as Dean from the College of Agriculture in March 1908, when he became fifty years old. However, he did not submit his resignation until June 1909. It was submitted at a time of considerable personal tension between him and the University administration, tension that may have strengthened his conviction that he could do no more for his College under existing bonds and frustrations. He was persuaded to stay and was given a leave of absence for the following year. Returning from this in 1910 and finding commitments unfulfilled he gave a year's notice and a report on changes to be effected by state and university legislation. This resulted in great agitation in his support from students, faculty, alumni, and the state's rural population. It also brought about changes in the state's agricultural educational policy, increased fiscal support to the College by the state, and clarified some of the issues between Bailey and the University administration. Despite the urging of his

faculty and students that he remain, Bailey resigned from the College, in July, 1913. The following year witnessed completion of copy for the first two of the six volumes of the *Standard Cyclopedia of Horticulture* and his sailing in July, 1914, for New Zealand.

Agriculture during the last half-century owed much to Bailey the editor. Just as there was a lack of modern horticultural books when he came to Cornell in 1888, so also was there a comparable lack of books in other fields of agriculture. During the period of 1890-1940 he edited 117 titles by 99 authors from all over the country, covering subjects in agronomy, economics, botany, pomology, animal husbandry, dairy industry, soils and fertilizers, plant pathology, commercial floriculture, and home economics. The manuscripts he edited during the first half of this period often came from authors more versed in their subject than in letters, and the editing frequently required complete rewriting by Bailey. His editorial contribution during that era was considerable. In 1890, Bailey accepted the editorship of the popular monthly, *American Garden,* a position he held for nearly two years. Again in 1901 he accepted the editorship of *Country Life in America,* retaining the position for the first two and one-half years of that periodical's life.

Bailey was a man of vigorous, direct, and driving personality, as is shown by the accomplishments presented above. But he was also a man of aesthetic sensitivity—reflective, and considerate of his fellow man. The deeper qualities have appeared over the years in his poems and philosophical writings. The former were assembled and published in three different books, of which *Wind and Weather* (1916) is the most complete. Some reviewers have recognized in them a quality of Whitman, and others have compared them to writings by Thoreau; all have agreed that the best are among those eulogizing the beauties of nature. Bailey's philosophical writings covered a wide range of topics; his best is acknowledged to be *The Holy Earth,* a book about man's debt to the earth, and the earth's goodness to man. It is Bailey's account of his philosophy of life and his belief in God.

Students at the College during Dr. Bailey's twenty-five years as Professor and Dean remember to a man his personable and understanding affection for them as individuals. He was available for friendly consultation and counsel. Sunday evenings his home was open to his students, who came and were inspired by his informal talks, recitations of poetry, and readings from such men as Poe, Whitman, Arnold, Lanier and Emerson. Later, as the group became too large, these gatherings became bimonthly "Assemblies" first in Barnes and later in Roberts Hall, patronized by students and faculty alike.

By many admirers, Bailey has been thought of as a plant explorer extraordinary, but he never wrote of his travels, prefering to continue his researches than to devote effort to recounting his past. His travels after retirement were for scientific purposes, for observation and collection of plants—plants pressed and dried for the herbarium, not for culture in the garden or the conservatory. For the most part, the trips to the tropics were in quest of palms and cucurbits, and to temperate

parts for blackberries and their kin. His searches took him to every major island of the West Indies, southern Brazil and the Matto Grosso region of the upper Amazon, British Guiana, Venezuela and Colombia. He knew Mexico intimately and had collected several times in Panama. In 1917, while he and his family were in the Orient, he went inland to Honan in search of prototypes of cabbages and their relatives. On another occasion he collected in New Zealand, with stops in Tahiti, Fiji, and Raratonga. In 1910 he and Mrs. Bailey had had to cancel a reservation at the Royal Hawaiian Hotel, Honolulu, that he might return to Cornell to settle a major administrative problem. Plans to visit Honolulu did not materialize until 1917. Earlier travels to Europe, commencing with his first in 1888, another in 1896 when he took his family for a year's stay in Munich, again in 1904, and with Mrs. Bailey in 1911, combined studies in agriculture, horticulture, and taxonomic botany. His last trip to Europe was in 1919, when his return to this country was nearly blocked by the commandeering of all available ships for the transportation of homeward-bound American and Canadian troops. In December, 1949, when he fell and broke his upper leg in a New York bank, he had in his pocket a set of one-way airline tickets to Dakar, Leopoldville, and other points in tropical Africa.

Yes, Dean Bailey proved himself a horticulturist, botanist, author, editor, teacher, administrator, poet, traveller, and philosopher. But more than that he was a man of strong character. To the end of his life he was intolerant of regimentation and bureaucracy. For the critics of his administrative abilities, who correctly considered him at times to be autocratic, dictatorial, and quick of decision, there remains the fact that time has proven most of his judgments correct. He got things done with dispatch and efficiency. Through the years he became known as one never too busy to stop his work and help an associate, a student, or a worker. Honesty and integrity were a passion with him, as strict as his posture was erect. He was charitable to his fellow man to a fault, and even in his last years was understanding of his professional critics. He looked for the good in the world. He lived a good life.

Vital statistics

Liberty Hyde Bailey was born March 15, 1858, in South Haven, Michigan, the son of Liberty Hyde Bailey, Sr., and Sarah Harrison Bailey. He was educated at Michigan Agricultural College, receiving his B.S. degree in 1882, his M.S. in 1886. On June 6, 1883, he married Annette Smith, who died in June 1938. They had two children, Sara Bailey Sailor (born June 29, 1887, died April 1936) and Ethel Zoe Bailey (born November 17, 1889); and two grandchildren, Annette Sailor Page and Samuel Sailor. Dr. Bailey died in Ithaca, New York, December 25, 1954.

Degrees, honors, and societies

1882 Bachelor of Science, Michigan Agricultural College

1885 Marshall P. Wilder Bronze Medal, American Pomological Society

1886 Master of Science, Michigan Agricultural College

1893 One of five founding members of Botanical Society of America

1896 Member, American Philosophical Society

1897 Veitch Silver Medal, Royal Horticultural Society, London

1898 Diploma of Honor, Royal Botanic Gardens, Denmark

1902 Honorary member, Rhode Island Horticultural Society
Honorary member, American Scenic and Historic Preservation Society

1903 Founding member, American Society for Horticultural Science; President, 1903-1907

1906 President, American Association of Agricultural Colleges and Experiment Stations

1907 Honorary LLD, University of Wisconsin

1908 Honorary LLD, Alfred University, New York

1909 Honorary member, Philadelphia College of Pharmacy

1910 Honorary member, Horticultural Society of Norway

1914 President, American Nature-Study Society. Re-elected in 1915
Honorary member, Horticultural Society, New Zealand

1917 Member, National Academy of Sciences of U.S.A.
Honorary member, Japan Agricultural Society
Honorary member, Horticultural Society of Japan
Honorary member, Horticultural Society of China
President, American Pomological Society, 2-year term

1919 Honorary Litt.D., University of Vermont

1921 Marshall P. Wilder Silver Medal, American Pomological Society
Honorary member, Phi Beta Kappa scholastic honor society, Cornell University

1923 Diploma of Honor, Reale Academia di Agricultura di Torino [Italy]

1924 Honorary member, Pi Alpha Xi honorary floriculture society

1925 Honorary life member, American Rose Society

1926 President, IVth International Botanical Congress, Ithaca
President, Botanical Society of America
President, American Association for the Advancement of Science

1927 Veitch Gold Medal, Royal Horticultural Society, London
George Robert White Gold Medal, Massachusetts Horticultural Society

1928 Grande Médaille d'Isidore Geoffroy Saint-Hilaire, Société nationale d'Acclimation de France
Honorary Fellow, Royal Irish Academy of Dublin

1931 Gold Medal, Garden Club of America
Arthur Hoyt Scott Gold Medal and Award, Swarthmore College, Penna.
Distinguished Service Award, National Home Planning Bureau of the American Association of Nurserymen
President, American Country Life Association

1932 Corresponding Member, Academy of Natural Sciences of Philadelphia
Honorary D.Sc., University of Puerto Rico

1933 Honor Certificate for Distinguished Service, Epsilon Sigma Phi, national honorary extension fraternity

1937 Distinguished Service Ruby, Epsilon Sigma Phi fraternity
Honorary member, Société Lyonnaise d'Horticulture

1938 Silver Medal, National 4-H Club Congress

1939 President, American Society of Plant Taxonomists

1940 Fellow, Cactus and Succulent Society of America

1945 Honorary Fellow, Botanical Society of Edinburgh
Honorary member, Linnæan Society of London

1946 Award of Honor, Ministeria Agricultura y Cria, Caracas, Venezuela

1947 Gold Medal, "The L. H. Bailey Award," National Garden Institute, Chicago
Marshall P. Wilder Silver Medal, American Pomological Society
Gold Medal, National Institute of Social Sciences

1948 Johnny Appleseed Bronze Medal and Certificate of Recognition, Men's Garden Club of America
Silver Medal "Green Thumb Award", National Victory Garden Institute, Washington, D. C.
National Award Scroll, American Agricultural Editor's Association
Bronze Medal, Exposition of Women's Art and Industries

1949 Honorary member, Vegetable Grower's Association of America
Gold Medal, National Council of State Garden Clubs

1950 Illuminated Testimonial Certificate, for 75 years of continuous service and contribution to horticulture. American Association of Nurserymen

1951 Citation for Distinguished Service, Garden Club Federation of Pennsylvania
Gold Medal, Federated Garden Clubs of New York

1952 Honorary member, Long Island Horticultural Society, New York
Distinguished Service Award, New York Botanical Garden

1954 Bronze Centennary Medal, Société Botanique de France

Bibliography of Books

The writings of Liberty Hyde Bailey cover a span of eighty-one years. His first was a paper delivered in person, at the age of fifteen, before the Michigan State Horticultural Society and was titled *Birds*. His last was a book, *The Garden of Bellflowers*. His writings, other than books, cover many fields and are to be sought in periodicals of many countries. No complete bibliography of them is known to exist, although I have a file of more than 700 titles. When complete, it deserves to be published, for only by a survey of his writings as a whole can his many contributions be fairly appraised.

The bibliography of books provided below omits completely his very substantial contributions to taxonomic botany. His papers in this field exceed one hundred titles and one of them (the Rubus monograph) comprises the fifth volume of *Gentes Herbarum*. Omitted also are his papers reporting his researches in horticulture, plant-breeding, rural sociology, and education administration. Until a complete bibliography is available, interested persons must consult the journals where these papers were published; they include the Botanical Gazette, Bulletin of the Torrey Botanical Club, Science, Gentes Herbarum, American Garden, Country Life in America, Cornell Countryman, reports and proceedings of state horticultural and pomological societies, and the several series of bulletins from the N. Y. State College of Agriculture and its experiment station.

There are also omitted from the bibliography that follows the one hundred and seventeen titles of Macmillan-published agricultural books

by various authors that were edited by Bailey during the half-century from 1890 to 1940. However, the encyclopedic works edited by him are included separately at the end of the bibliography.

Field notes on apple culture. 90 p. Orange Judd Co., New York, 1886.

The garden fence. 36 p. Wright & Potter Co., Boston. 1886.

Talks a-field: about plants and the science of plants. 173 p. Rural Publishing Co., New York. 1887.

Horticulturist's rule-book; a compendium of useful information for fruit-growers, truck-gardeners, florists and others. Completed to the close of the year 1889. 236 p. Rural Publishing Co., New York. 1890. Ed. 2, completed to the beginning of the year 1892. 221 p., 1893. New and rev. ed. 312 p. The Macmillan Co., New York. 1908.

Annals of horticulture in North America for the year 1889; a witness of passing events and a record of progress. 249 p. Rural Publishing Co., New York, 1890.

The nursery-book; a complete guide to the multiplication and pollination of plants. 304 p. Rural Publishing Co., New York, 1891. Ed. 2, a reissue of ed. 1. Ed. 3, 365 p. The Macmillan Co., 1896. Eds. 4–15, reissues of ed. 3.

Annals of horticulture in North America for the year 1890. 312 p. Rural Publishing Co., New York, 1891.

Cross-breeding and hybridizing. 44 p. Rural Publishing Co., New York, 1892.

Annals of horticulture in North America for the year 1891. 415 p. Rural Publishing Co., New York, 1892.

American grape training. An account of the leading forms now in use of training the American grapes. 95 p. The Rural Publishing Co., New York, 1893.

Annals of horticulture in North America for the year 1892. 387 p. Rural Publishing Co., New York, 1893.

Annals of horticulture in North America for the year 1893. 179 p. Orange Judd Co., New York, 1894.

Plant-breeding; being six lectures upon the amelioration of domestic plants. 293 p. The Macmillan Co., 1895. Ed. 2, 355 p., 1902. Ed. 3, 334 p., 1904. Ed. 4, with a new chapter on current plant-breeding practice. 483 p., 1906.

The survival of the unlike; a collection of evolution essays suggested by the study of domestic plants. 515 p. The Macmillan Co., New York, 1896.

The forcing book; a manual of the cultivation of vegetables in glass houses. 266 p. The Macmillan Co., 1896. Eds. 2–9, reissues of ed. 1.

The principles of fruit-growing. 516 p. New York, 1897. Ed. 2, 1898. Eds. 3–19, reissues of ed. 2. Ed. 20, completely revised, 432 p., 1915.

The principles of agriculture. 300 p. The Macmillan Co., New York, 1898. Eds. 2–14, reissues of ed. 1. Ed. 15, revised with a review and catechism for reading-clubs and teachers. 336 p., 1909. Eds. 16–26, reissues of ed. 15.

Lessons with plants. Suggestions for seeing and interpreting some of the common forms of vegetation. 491 p. The Macmillan Co., New York, 1898. Ed. 2, a reissue of ed. 1.

The pruning-book. A monograph of the pruning and training of plants as applied to American conditions. 537 p. The Macmillan Co., New York, 1898. Eds. 2–11, reissues of ed. 1.

First lessons with plants; being an abridgement of "Lessons with plants." 117 p. The Macmillan Co., New York, 1898.

Garden-making: suggestions for utilizing of home grounds. 417 p. The Macmillan Co., 1898. Ed. 2, a reissue of ed. 1. Ed. 3, revised. 417 p., 1899. [Reprinted as separate "editions" to 1909].

The pruning-manual, being the 18th ed. revised and reset, of the Pruning-book which was first published in 1898. 407 p. The Macmillan Co., New York, 1916.

Sketch of the evolution of our native fruits. 461 p. The Macmillan Co., New York, 1898.

Botany: an elementary text for schools. 355 p. The Macmillan Co., New York, 1900. Ed. 2 (1901) is a reprint of ed. 1 with corrections. Eds. 3–11, reissues of ed. 2. Ed. 12, 431 p., 1907. "New edition" with subtitle "a guide to the knowledge of the vegetation of the neighborhood," 465 p., 1913.

The principles of vegetable-gardening. 485 p. The Macmillan Co., New York, 1901. Eds. 2–8, reissues of ed. 1. Ed. 9, 458 p., 1910. Eds. 10–17, reissues of ed. 9. Ed. 18, 490 p., 1921.

Nature portraits; studies with pen and camera of our wild birds, animals, fish and insects (text only, plates and illustrations "by the best nature photographers"). 40 p. Doubleday, Page & Co., New York, 1902.

The nature-study idea; being an interpretation of the new school-movement to put the child in sympathy with nature. 159 p. Doubleday, Page & Co., New York, 1903. Ed. 2 a reissue of ed. 1, 1905. Ed. 3, 246 p., The Macmillan Co., New York, 1909. Ed. 4, rev., 1911.

Outlook to nature. 296 p. The Macmillan Co., New York, 1905. New and revised ed. 195 p., 1911.

The state and the farmer. 177 p. The Macmillan Co., New York, 1908. Ed. 2, a reissue of ed. 1, 1911.

First course in biology. Part I. Plant biology, 204 p., The Macmillan Co., New York, 1908. [Parts II & III by W. M. Coleman]. Ed. 2, a reissue of ed. 1, 1909.

Beginners botany. 208 p. The Macmillan Co., New York, 1908.

Poems. 21 p. The Cornell Countryman, Ithaca, N. Y., 1908.

The training of farmers. 263 p. The Century Co., New York, 1909.

Manual of gardening; a practical guide to the making of home grounds and the growing of flowers, fruits, and vegetables for home use. 539 p. The Macmillan Co., New York, 1910. Ed. 2, 541 p., 1912. Eds. 3–11, reissues of ed. 2. Ed. 12, revised, 539 p., 1925, differs in corrections of nomenclature.

The country-life movement in the United States. 220 p. The Macmillan Co., New York, 1911. Reprinted by University of North Carolina Press, 1944.

Farm and garden rule-book; a manual of ready rules and reference with recipes, precepts, formulas, and tabular information for use of general farmers, gardeners, fruit-growers, stockmen, dairymen, poultrymen, foresters, rural teachers, and others in the United States and Canada. 587 p. The Macmillan Co., New York, 1911. [Previous editions (1st ed., 1889) published under title "The horticulturist's rule-book."]

Outlook. 11 p. Privately published, Ithaca, N. Y., 1911.

Report of the Commission on Country Life. 105 p. Sturgis & Walton Co., New York, 1911.

Botany for secondary schools; a guide to the knowledge of the vegetation of the neighborhood. 465 p. The Macmillan Co., New York, 1913. [First published in 1900 as "Botany; an elementary text for schools." The 1913 edition completely revised.]

York state rural problems. Vol. 1, 273 p., 1913; vol. 2, 261 p., 1915. J. B. Lyon Co., Albany, N. Y.

Ground levels in democracy. 95 p. Privately published, Ithaca, N. Y., 1916.

Wind and weather. 216 p. Cornell Publishing Co., Ithaca, N. Y., 1916. [Collected poems.]

The holy earth. 177 p. Comstock Publishing Co., Ithaca, N. Y., 1918. Reprinted by The Christian Rural Fellowship, New York, 1943.

Home grounds, their planning and planting. 48 p. American Association of Nurserymen, Harrisburg, Pa., 1918.

What is democracy? 175 p. Comstock Publishing Co., Ithaca, N. Y., 1918.

Universal service, the hope of humanity. 165 p. Sturgis & Walton Co., New York, 1918.

The school-book of farming; a text for the elementary schools, homes and clubs. 388 p. The Macmillan Co., New York, 1920.

The nursery-manual; a complete guide to the multiplication of plants. 456 p. The Macmillan Co., New York, 1920.

The apple-tree. 117 p. The Macmillan Co., New York, 1922.

The cultivated evergreens; a handbook of the coniferous and most important broad-leaved evergreens planted for ornament in the United States and Canada. 434 p. The Macmillan Co., New York, 1923.

The seven stars. 165 p. The Macmillan Company, New York, 1923.

Manual of cultivated plants; a flora for the identification of the most common or significant species of plants grown in the continental United States and Canada, for food, ornament, utility, and general interest, both in the open and under glass. 851 p. The Macmillan Co., 1924. [See under 1949 for revised edition.]

The gardener; a book of brief directions for the growing of the common fruits, vegetables and flowers in the garden and about the house. 260 p. The Macmillan Company, New York, 1925. [A completely revised version of C. E. Hunn and L. H. Bailey, "The amateur's practical garden-book . . ." published in 1900.]

The harvest of the year to the tiller of the soil. 209 p. The Macmillan Co., New York, 1927.

The garden lover. 154 p. The Macmillan Co., New York, 1928.

The cultivated conifers in North America, comprising the pine family and the taxads; successor to *The cultivated evergreens*. 404 p. The Macmillan Co., New York, 1933.

How plants get their names. 209 p. The Macmillan Co., New York, 1933.

Gardener's handbook, successor to *The gardener*; brief indications for the growing of common flowers, vegetables and fruits in the garden and about the home. 292 p. The Macmillan Co., 1934.

The garden of gourds, with decorations. 134 p. The Macmillan Co., New York, 1937.

The garden of pinks, with decorations. 142 p. The Macmillan Co., New York, 1938.

The garden of larkspurs, with decorations. 116 p. The Macmillan Co., New York, 1939.

Manual of cultivated plants most commonly grown in the continental United States and Canada. 1,116 p. The Macmillan Co., New York, 1949. [A completely re-studied and rewritten revision of the 1924 edition, and prepared by the author with the assistance of the staff of the Bailey Hortorium at Cornell Univ.]

The garden of bellflowers in North America, with decorations. 155 p. The Macmillan Co., New York, 1953.

Books written under joint authorship

Hunn, Charles E. and Bailey, L. H. The amateur's practical garden-book; containing the simplest directions for the growing of the commonest things about the house and garden. 250 p. The Macmillan Co., New York, 1900. Later "editions" are reissues of ed. 1. Ed. 8, bears the title *The practical garden-book* . . . (without change of content from earlier printings), 1913.

Bailey, L. H. & E. Z. Hortus; a concise dictionary of gardening, general horticulture and cultivated plants in North America. 652 p. The Macmillan Co., New York, 1930.

———— & ——. Supplement to Hortus, for the five current years including 1930. 655–755 p. The Macmillan Co., New York, 1935.

———— & ——. Hortus second; a concise dictionary of gardening, general horticulture and cultivated plants in North America. 778 p. The Macmillan Co., New York, 1941. [A new work, based on the format and scope of Hortus.]

Encyclopedic and Directory works edited by L. H. Bailey

Cyclopedia of American horticulture, comprising suggestions for cultivation of horticultural plants, descriptions of the species of fruits, vegetables, flowers, and ornamental plants sold in the United States and Canada, together with geographical and biographical references. L. H. Bailey, editor and Wilhelm Miller, associate editor, aided by over 2,000 contributors. Vol. 1, A–D, p. 1–510, 1900; vol 2, E–M, p. 511–1054, 1900; vol. 3, N–Q, p. 1055–1486, 1901; vol. 4, R–Z, p. 1487–2016, 1902. Ed. 2, 1902 ["several changes have been made . . . . reducing typographical errors and inconsistencies, ... chiefly in the first volume. . . ."]. Ed. 3, 1904 [contained further corrections]. Ed. 4, 6 vols., 1906. Copyrighted by the Macmillan Co., published by Doubleday, Page & Co., a corrected reprint of ed. 3 with a "Synopsis of the vegetable kingdom," 42 p., by Wilhelm Miller, prepared for the original edition but omitted for lack of space.

Cyclopedia of American agriculture; a popular survey of agricultural conditions, practices and ideals in the United States and Canada. Vol. 1, Farms, 618 p., 1907; vol. 2, Crops, 699 p., 1907; vol. 3, Animals, 708 p., 1908; vol. 4, Farm and community (incl. biographies, p. 547–628), 650 p., 1909. The Macmillan Co., New York.

Cyclopedia of farm crops, a popular survey of crops and crop-making methods in the United States and Canada. 699 p. The Macmillan Co., New York, 1922. [A reprint of vol. 2 of the Cyclopedia of American Agriculture.]

Cyclopedia of farm animals, a popular survey. 708 p., The Macmillan Co., New York, 1922. [A reprint of vol. 3 of the Cyclopedia of American Agriculture.]

RUS; rural uplook service. A register of rural leadership in the United States and Canada. 313 p. Privately published, Ithaca, N. Y., 1918. Ed. 2, 533 p., 1920. Ed. 3, 758 p., 1925 [pp. 745–758 comprise a "Directory of journals devoted to agriculture and rural life."] Ed. 4, 769 p., 1930.

The standard cyclopedia of horticulture; a discussion for the amateur, and the professional and commercial grower, of the kinds, characteristics and methods of cultivation of the species of plants grown in the regions of the United States and Canada for ornament, for fancy, for fruit, and for vegetables; with keys to the natural families and genera, descriptions of the horticultural capabilities of the states and provinces and dependent islands, and sketches of eminent horticulturists. Originally published in 6 vols.: vol. 1, A–B, p. 1–602, Mar. 1914; vol. 2, C–F, p. 603–1200, July 1914; vol. 3, F–K, p. 1201–1760, May 1915; vol. 4, L–O, p. 1761–2422, Feb. 1916; vol. 5, P–R, p. 2423–3042, Oct. 1916; vol. 6, S–Z, p. 3043–3639, Mar. 1917. The Macmillan Co., New York. Ed. 2, 3639 p. in 6 vols. was published in 1922 and differs only in the correction of misprints. Reprinted in 1925, on india paper as a "new edition" in 3 vols. Subsequent so-called "editions" are reprints from the plates of the 2nd edition of 1922, and the practice of designating these successive printings as editions was discontinued in 1952. The textual content of all editions is that of the original publication of 1914–17.

PELARGONIUMS IN CULTIVATION (Continued from page 25)

name P. ferulaceum (Burman filius) Willdenow, since that is the earliest for it.

Plants offered in the trade as P. parviflorum are usually low and more or less herbaceous, with very small deep-purplish-red flowers. The rounded and scalloped leaves are said to have a coconut scent. Plants of this character were illustrated by Andrews as Geranium parviflorum in "Geraniums," plate 106 (1805), and it is perhaps from this source that the epithet parviflorum became associated with garden material properly called Pelargonium grossularioides (Linnæus) L'Héritier ex Aiton (fig. 14). Californians will recognize P. grossularioides as a species that has become naturalized in some areas, particularly in the region of San Francisco.

While the real P. grossularioides usually masquerades as P. parviflorum, a still different plant is often listed by the name P. grossularioides. The plant in question is a variegated form of Pelargonium crispum known by the fancy or clonal name P. crispum 'Variegatum'. This is a shrubby, lemon-scented pelargonium with conspicuous flowers and toothed, crisped leaves, and will easily be distinguished from the true P. grossularioides illustrated in fig. 14.

P. radens, P. denticulatum and P. filicifolium

Pelargonium radens (incorrectly known as P. Radula) is a scented-leaved pelargonium that is even more widely grown than would appear, for it is often found erroneously labelled P. denticulatum, P. 'Skeleton Rose', or P. 'Dr. Livingston'. The converse is equally true, for P. denticulatum itself is much less frequent, although a narrow-leaved form, P. denticulatum 'Filicifolium', is more common. The last is often called P. filicifolium, a horticultural name without botanical standing that is best given the status of a fancy name.

The two species may be distinguished by their leaves or their flowers. Both have the leaves finely divided and rather fernlike, but the upper surface of the leaves is harshly hairy and the margins are rolled under in P. radens, while leaves of P. denticulatum are smooth and sticky above with flat or ruffled, but not inrolled, margins. Flowers, too, are easily told apart. In P. radens the margins of the upper petals are entire (fig. 12, A and B); those of P. denticulatum have a prominent notch at the tip (fig. 15).

P. rapaceum

Pelargonium rapaceum (Linnæus) L'Héritier ex Aiton is a stemless, tuberous-rooted species with pinnate leaves and small rosy-white to flesh-colored or yellow flowers that resemble miniature pea-flowers in having the two upper petals bent back, and the three lower petals held close together. A few collections in the United

Fig. 14. Pelargonium grossularioides, adapted from Refugium Botanicum 1: pl. 5 (1868).

States have the species represented, but certainly the majority of plants so offered in the trade are a shrubby, large-flowered clone with rounded, more or less ruffled, and only slightly lobed, sweet-scented leaves. As Helen Van Pelt Wilson has pointed out in the third printing of "Geraniums" (1950), this clone should be known as Pelargonium 'Mrs. Kingsley'.

Erroneous names

Other names have entered our lists by error. Pelargonium hirsutum has been used for the hybrid P. × Blandfordianum; P. squarrosum for what is apparently P. pinnatum; P. filtrum, a name of no standing, for the clone Pelargonium 'Mrs. Taylor'. Pelargonium scabrum, a species similar to P. crispum in habit but with very deeply divided leaves, is frequently listed in catalogues. The species may be cultivated, but all material so far observed is of apparent hybrid origin, with coarse leaves somewhat like those of P. graveolens. These plants should probably be called Pelargonium 'M. Minor'. Among names attached in error to nondescript hybrid forms derived largely from P. capitatum and P. graveolens are P. acerifolium, P. × Dennisianum, P. × decipiens, P. × melissinum and P. adcifolium, a name that has no standing.

Names for plants still unplaced but of dubious identification are: P. conduplicatum, originally used for plants similar to P. cordifolium but now attached to plants of the P. zonale alliance; P. × divaricatum Dietrich, applied to plants supposedly derived largely from P. fulgidum and not at all similar to wild plants generally known by the illegitimate name P. divaricatum (Thunberg) DeCandolle; P. gratum, used for plants perhaps related to P. crispum but not certainly known; P. × latifolium, best referred to P. × domesticum but perhaps used in error for P. crispum 'Latifolium'; P. odoratum used erroneously for Pelargonium × limoneum 'Lady Mary'; P. scandens; and the obscure hybrid P. × strictum.

Checklist of Pelargonium Species and Latin-named Hybrids Listed in the United States

Correct (valid) names are underlined, synonyms or incorrect names are not. The more commonly grown species are designated by an asterisk.

abrotanifolium (Linnæus filius) Jacquin
acerifolium L'Héritier
*acetosum (Linnæus) L'Héritier ex Aiton
adcifolium - a name of no standing
alchemilloides (Linnæus) L'Héritier ex Aiton
alternans Wendland
angulosum (Miller) L'Héritier ex Aiton
apiifolium Jacquin filius

Fig. 15. Pelargonium denticulatum, adapted from Sweet, Geraniaceæ, pl. 109.

×ardens Loddiges [P. fulgidum × P. lobatum]
×asperum Ehrhart ex Willdenow [P. graveolens × P. radens]
australe Willdenow
bicolor (Jacquin) L'Héritier ex Aiton
×Blandfordianum (Andrews) Sweet [P. echinatum × P. graveolens]
Burtoniæ L. Bolus
capitatum (Linnæus) L'Héritier ex Aiton
carnosum (Linnæus) L'Héritier ex Aiton
citriodorum (Cavanilles) Martius :: P. acerifolium
citriodorum Schrank :: P. × citrosum
×citrosum Voigt ex Sprague [P. crispum derivative]
conduplicatum Willdenow
cordifolium (Cavanilles) Curtis
×coccineum Ehrhart :: P. × hybridum
×concolor Sweet [P. capitatum × P. ×ignescens]
crassicaule L'Héritier ex Aiton
crispum (Linnæus) L'Héritier ex Aiton
crithmifolium Smith
cucullatum (Linnæus) L'Héritier ex Aiton
dasycaule Haworth
×decipiens Trattinick
×Dennisianum Sweet [P. cucullatum derivative]
×denticulatum Jacquin
×divaricatum Dietrich [P. fulgidum derivative]
×domesticum L. H. Bailey
echinatum Curtis
Endlicherianum Fenzl
ferulaceum (Burman filius) Willdenow
filicifolium Hort. :: P. denticulatum 'Filicifolium'
filtrum - a name of no botanical standing, used for P. 'Mrs. Taylor'
*×fragrans Willdenow [P. exstipulatum × P. odoratissimum]
×frutetorum R. A. Dyer
*fulgidum (Linnæus) L'Héritier ex Aiton
*gibbosum (Linnæus) L'Héritier ex Aiton
×glaucifolium Sweet [P. gibbosum × P. lobatum]
*glutinosum (Jacquin) L'Héritier ex Aiton
grandiflorum Willdenow
gratum Willdenow
*graveolens L'Héritier ex Aiton
*grossularioides (Linnæus) L'Héritier ex Aiton
hederæfolium Salisbury :: P. lateripes L'Héritier ex Aiton
hirsutum (Burman filius) L'Héritier ex Aiton
*×hortorum L. H. Bailey
×hybridum (Linnæus) L'Héritier ex Aiton [P. inquinans × P. zonale]
×ignescens Loddiges [P. fulgidum derivative]
inquinans (Linnæus) L'Héritier ex Aiton
×jatrophæfolium DeCandolle [P. denticulatum × P. quercifolium]
lateripes L'Héritier ex Aiton
×latifolium Sweet
×limoneum Sweet [P. crispum derivative]
malvæfolium Jacquin filius :: P. alchemilloides
×melissinum Sweet [P. crispum × P. graveolens]
×monstrum L'Héritier ex Aiton
×nervosum Sweet
*odoratissimum (Linnæus) L'Héritier ex Aiton
odoratum Hoffmannsegg
palmatum - a name without botanical standing
palpilionaceum (Linnæus) L'Héritier ex Aiton
paradoxum Dinter

parviflorum Wendland :: P. ferulaceum
parviflorum of horticulture :: P. grossularioides
patulum Jacquin
*peltatum (Linnæus) L'Héritier ex Aiton
pinguifolium Sweet
pinnatum (Linnæus) L'Héritier ex Aiton
præmorsum (Andrews) Dietrich
*quercifolium (Linnæus filius) L'Héritier ex Aiton
quinatum Sims :: P. præmorsum
*radens H. E. Moore
Radula (Cavanilles) L'Héritier ex Aiton :: P. radens
rapaceum (Linnæus) L'Héritier ex Aiton
*reniforme Curtis
×roseum Ehrhart :: P. × hybridum
roseum of horticulture :: P. × asperum
× sæpeflorens Sweet [P. echinatum × P. reniforme]
salmoneum R. A. Dyer
scabrum (Linnæus) L'Héritier ex Aiton
scandens Ehrhart
× Scarboroviæ Sweet [P. crispum derivative?]
squarrosum Dinter
× Stapletonii Sweet [P. echinatum × P. × sæpeflorens]
× strictum Dietrich
terebinthinaceum (Cavanilles) Small :: P. graveolens
*tetragonum (Linnæus filius) L'Héritier ex Aiton
*tomentosum Jacquin
viscosum (Cavanilles) Harvey & Sonder ex Jackson :: P. glutinosum
*vitifolium (Linnæus) L'Héritier ex Aiton
xerophyton Schlechter ex Knuth
zonale (Linnæus) L'Héritier ex Aiton

Persons seeking a nursery source of an unusual tree or shrub often have turned to the annual catalogue of Henry Kohankie and Son, Painesville, Ohio. The Kohankie Nursery exceeded 1,000 acres in area and has been said to be the largest range of woody plant materials hardy in that part of the country. The nursery was sold last autumn to Horton Nurseries, Inc., a firm previously situated at Rocky River, Ohio.

In response to an inquiry as to the future status of the Kohankie Nursery, we are advised that the new management proposes to conduct the business "with the same high principles, quality, and wide range of stock that was offered by Henry Kohankie & Son." All original personnel have been retained and the famous Kohankie catalogue will continue - under the new name of Horton Nurseries, Inc.

G. H. M. L.

Notes on Cultivated Labiates
5. Lavandula

Gordon P. DeWolf, Jr.

During the past several years the Bailey Hortorium has been fortunate in receiving from an enthusiastic horticulturist in California, Miss Edna K. Neugebauer, a large number of specimens of various species of the genus Lavandula which she has under cultivation. These specimens, together with others in the Hortorium collections, have given us a good idea of the genus as it is in cultivation in this country. Also, we have been fortunate in that a recent taxonomic treatment of this genus on a comprehensive basis is available, a treatment prepared in the Royal Botanic Garden at Kew by Miss D. A. Chaytor, and published in the "Journal of the Linnæan Society" in 1937. The following key and notes on the species, compiled during the revision of the treatment of the genus for "Hortus III," and based in part on the monograph referred to, are presented in the hope that they may be of use in identifying cultivated material.

It is a curious thing, that the common lavenders of our gardens today, Lavandula Spica and L. latifolia, are not surely mentioned in the writings of classic times. Rather, the lavenders of the Romans appear to have been L. Stoechas, L. pedunculata, and L. dentata. It is not until the writings of St. Hildegard in the 12th Century that certain reference is made to our common cultigens.

Throughout the Middle Ages the European plants now comprehended in the single genus Lavandula were commonly separated into two genera: Stoechas, comprising the three species mentioned above (L. Stoechas, L. pedunculata, and L. dentata), which is readily recognized by the development of some of the uppermost floral bracts of the inflorescence into petaloid bodies (corona); and Lavandula, which included L. Spica and L. latifolia. Indeed, it was not until the work of Linnæus that the two genera were really united.

According to the younger Linnæus, in his monograph of the genus (which will be noticed below), the name lavender is derived from the Latin verb "lavere," meaning "to wash," presumably with reference to the use of aqueous or oleaginous infusions of the plants. Today, the distilled essential oils of several taxa are still in demand by the perfume industry for use in perfumes and other toiletries. They are no longer considered of great value as antiseptics, nor as palliatives for sprains and bruises. And, still, most of the

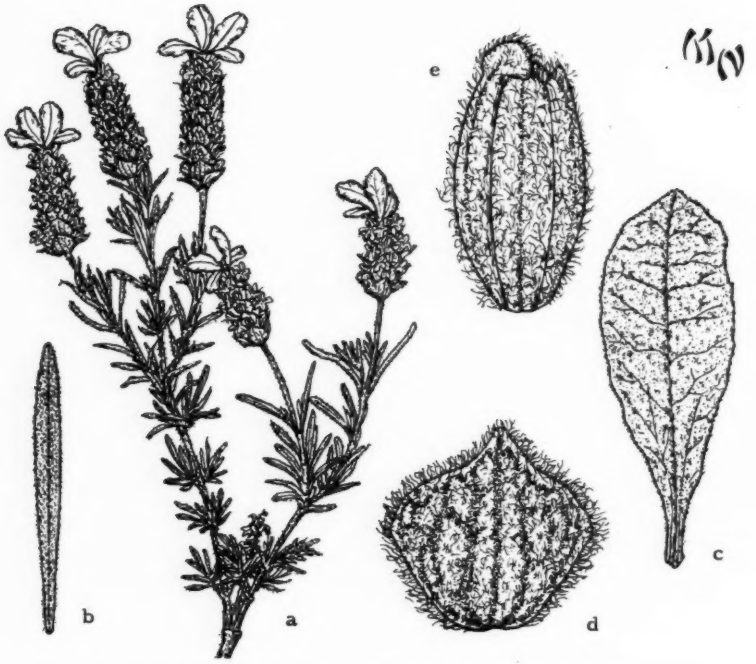


Fig. 16. Lavandula Stoechas: a, habit x 4/5; b, leaf x 2; c, sterile bract from top of inflorescence x 4; d, fertile floral bract x 6; e, calyx x 8.

lavender oil used comes from Europe. Attempts have been made to establish a domestic source for oil of lavender, but these have apparently all failed, principally because of the high cost of labor in this country.

Lavandula is a rather distinct genus whose immediate relationships are not at all apparent. It is a strongly circum-Mediterranean genus, with outliers in Arabia and India. In general, the plants are branching herbs or small shrubs, mostly aromatic. The leaves range from simple to bipinnate, and are covered with simple, branched, or stellate hairs and generally are provided also with stalked or sessile glands. The inflorescence is a spike-like, verticillate raceme, the peduncle of which may be simple or branched. The floral bracts are well developed. The calyx is 5-toothed, more or less bilabiate. The corolla is exserted, subequally 5-lobed, or bilabiate, with 2 lobes in the upper lip and 3 in the lower. The stamens are 4, didynamous, the anthers reniform.

Linnæus, in the "Species Plantarum" of 1753, recognized but 4 species in the genus. These were L. multifida and L. dentata from Spain, and L. Stoechas (which included L. pedunculata) and L. Spica from southern Europe. In 1780 Linnæus' son and namesake published a short monograph on the genus which was reprinted in Schreiber's edition of the "Amoenitates Academicæ" (vol. 10, Appendix, pp. 41-68) in 1790. To his father's 4 species he added L. pinnata, which was based on a specimen from cultivation sent to him by C. P. Thunberg, who had received it from England. Linnæus filius also included in the genus L. carnosa, an Indian plant which is now referred to the genus Anisochilus.

The first thorough-going monograph of the genus was that of Baron Frederic Charles Jean Gingins de Lassaraz, published in Geneva in 1826. In this, 12 species were recognized which were divided into 3 sections. George Bentham, in the "Labiatarum Genera et Species" of 1832-36, recognized a fourth section, and by the time of his treatment of the genus for De Candolle's "Prodromus" in 1848, the known species numbered 18. Eighty-nine years later, in 1937, Miss Chaytor recognized 28 species, and added one more section, making a total of 5.

Of the 5 sections admitted by Chaytor, we have records of representatives of 4 of them as being in cultivation in this country. The following key, adapted from that in Miss Chaytor's monograph, indicates the differences between the sections. Following this is a key to the species, without reference to the sections, which is based in part on the materials preserved in the Bailey Hortorium and in part on information contained in Chaytor's Monograph.

Key to the Sections of Lavandula

1. Verticils many-flowered, up to 7 flowers in the axil of each bract. Bracteoles (small, secondary bracts at the base of each pedicel) sometimes present. Posterior calyx-tooth enlarged into a more or less rotund or lanceolate appendage (fig. 16e and 17d): calyx 8-13-nerved, usually shortly pedicellate.

   2. Bracts dimorphic, the uppermost in each inflorescence enlarged, colored or white, sterile (having no flowers in their axils) (fig. 16a). Bracteoles absent. Calyx sessile or pedicellate. Corolla tube only slightly longer than the calyx: corolla-lobes 5, sub-equal, scarcely bilabiate. Nutlets sometimes with a gelatinous coating when wet. . . . . I. Stoechas

   2. Bracts more or less uniform, all fertile (fig. 17a). Bracteoles present. Calyx shortly pedicellate. Corolla-tube nearly double the length of the calyx: corolla lobes 5, bilabiate, the 2 upper lobes much the larger. Nutlets without a gelatinous coat when wet. . . . . II. Spica

1. Verticils 1- or 2-flowered, 1 flower in the axil of each bract. Bracteoles absent. Posterior calyx-tooth not enlarged to an appendage, though often broader than the others: calyx 15-nerved, sessile.

   3. Bracts arranged in exactly opposite pairs. . . . . III. Pterostoechas

   3. Bracts alternately or more or less spirally arranged. . . . . IV. Chætostachys

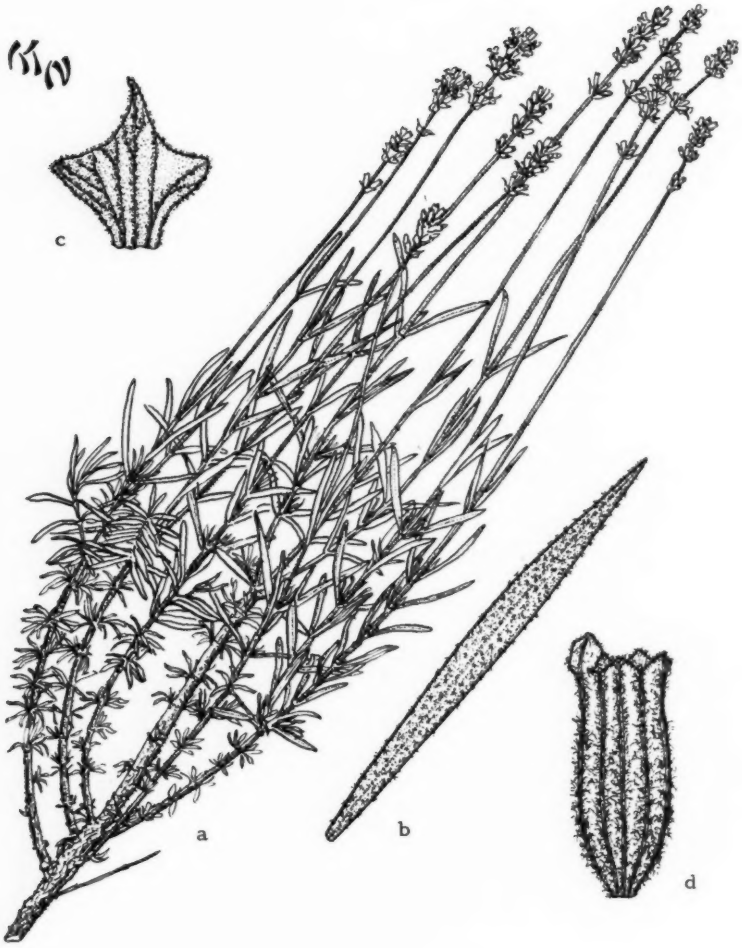


Fig. 17. Lavandula Spica: a, habit x 2/5; b, leaf x 2; c, floral bract x 6; d, calyx x 8.

Key to the Species of Lavandula

1. Inflorescence with the uppermost bracts sterile and petaloid (fig. 16a).
   2. Leaves entire (fig. 16b, 18B).
      3. Peduncle 10-25 cm. long. . . . . L. pedunculata Cavanilles
      3. Peduncle 1-5 cm. long. . . . . L. Stoechas Linnæus
   2. Leaves toothed or deeply crenate (fig. 18A). . . . . L. dentata Linnæus
1. Inflorescence with all the bracts fertile, none petaloid (fig. 17a, 19a).
   4. Leaves entire (fig. 17b, 18C and Da).
      5. Fertile bracts ovate to rhombic-lanceolate (fig. 17c). . . . . L. Spica Linnæus
      5. Fertile bracts linear or linear-lanceolate (fig. 18Db).
         6. Calyx with 13 nerves. . . . . L. latifolia Villars
         6. Calyx with 8 nerves. . . . . L. lanata Boissier
   4. Leaves once or more pinnately divided (fig. 19b, 20a, 21a).
      7. Bracts of the inflorescence in exactly opposite pairs.
         8. Leaves and stem with long (to 2 mm.) unbranched hairs, mixed with shorter hairs (fig. 19b, c); fertile bracts with 3 prominent nerves (fig. 19d). . . . . L. multifida Linnæus
         8. Leaves and stem without long unbranched hairs (fig. 20a and b, 21a and b); fertile bracts with 5 more or less prominent nerves (fig. 20c, 21c).
            9. Fertile bracts shorter than the calyces they subtend; leaves generally bipinnate, the segments very narrow (2-3 mm.), not white-pubescent (fig. 21a). . . . . L. canariensis Miller
            9. Fertile bracts longer than the calyces they subtend; leaves pinnate, the segments broader (3-4 mm.), hoary-white-pubescent (fig. 20a). . . . . L. pinnata Linnæus filius
      7. Bracts of the inflorescence alternate or in a more or less spiral arrangement. . . . . L. bipinnata Kuntze

I have seen no material of plants which have been offered in the trade as Lavandula alpina and L. pedemontana. These names have no botanical standing, and so I would be interested in seeing specimens of any plants which may be cultivated under these names.

With the questionable exception of some dwarf forms of Lavandula Spica, it is probable that none of the species of Lavandula are reliably hardy north of Philadelphia. The lavenders may be increased by seed, but are perhaps more easily propagated by cuttings, taken with a heel, at any time during the growing season. They prefer a well-drained, not too rich soil and a sunny location.

Section STOECHAS

It appears that in the later days of the Roman Empire the plant we now know as Lavandula Stoechas Linnæus (fig. 16) was known and used to some extent in toiletries. "Stoechas," which was used as a generic name in pre-Linnæan time, is said to be derived from

"Stoechades," the name of a group of islands off the harbor of what is now Hyères, a town east of Toulon on the Mediterranean coast of France.

How the Romans prepared this plant for use is uncertain, but a method of preparation recorded by J. C. Sawer, in his "Odorographia, a Natural History of Raw Materials used in the Perfume Industry," may throw some light on the matter. He says, "L. Stoechas is known in Spain as 'Romero Santo' (Holy Rosemary). Its essential oil (also that of L. dentata) is there extracted for household use, by suspending the fresh flowering stalks, flowers downwards, in closed bottles and exposing them for some time in the sun's rays; a mixture of water and essential oil collects at the bottom, which is used as a hæmostatic and for cleansing wounds."

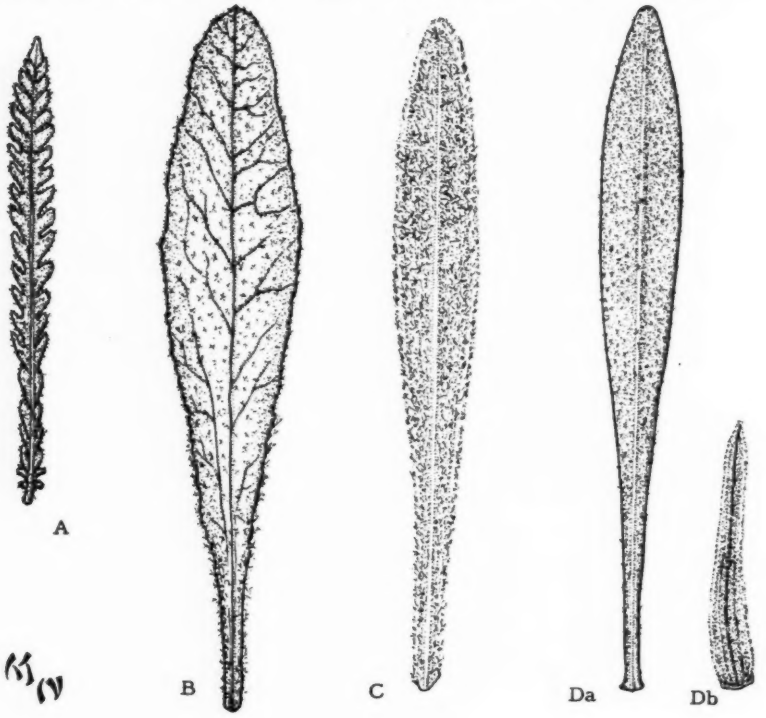


Fig. 18. A, Lavandula dentata, leaf x 2; B, L. pedunculata, leaf x 4; C, L. lanata, leaf x 2; D, L. latifolia: Da, leaf x 2; Db, floral bract x 6.

It has also been suggested, by Mrs. Fox, in her "Gardening with Herbs," that lavender was the base of the unguent, Spikenard, of the Bible. It is generally allowed now, however, that this was derived from Nardostachys jatamansi DeCandolle, a perennial member of the valerian family, native in the Himalayas and western Asia.

Lavandula Stoechas was well known to the herbalists of the Middle Ages, who called it Arabian or purple Stoechas. Philip Miller, in his Abridgement of his "Gardeners Dictionary" of 1754, called it "Cassidony." It is a widespread species, ranging from Asia Minor through southern Europe to the Canary Islands, and into North Africa.

Under favorable circumstances L. Stoechas forms a shrub to 1 meter tall, the leaves and young twigs densely covered with short, simple or branched hairs. The leaves are linear, to 2.5 cm. long, with more or less revolute margins. The peduncle is short, usually 7 - 14 mm. long, but in exceptional cases as much as 50 mm., bearing a compact, spike-like, strongly bracteate inflorescence. The fertile bracts in the lower portion of the inflorescence are strongly imbricate and long enough to conceal the calyces. At the apex of the inflorescence are a number of sterile bracts, much developed, petaloid, tinted and veined with purple, which are as much as 3.5 cm. long.

L. pedunculata Cavanilles (fig. 18B), which was known to the pre-Linnæan authors as "Stoechas longioribus ligulis" or as "Stoechas cauliculis non foliatis," is most easily distinguished from L. Stoechas, which it resembles, by the length of the peduncles which are 10-25 cm. long.

L. dentata Linnæus (fig. 18A) (sometimes called L. delphinensis in the trade, though this is a very different thing) differs in its linear or linear-oblong, pinnately or pectinately toothed leaves. Both of these species have a range in nature which approximates that of L. Stoechas.

Section SPICA

Linnæus included in his Lavandula Spica of the "Species Plantarum" two different taxa, which previous and subsequent authors have kept separate. Due to carelessness and misapplication of names, however, the synonymy of these two species has become rather involved. I have dealt with this situation at length in a paper to be published in "Gentes Herbarum," to which the reader is referred for a fuller treatment. It remains to be said here only that the taxon variously called L. vera DeCandolle or L. officinalis Chaix should be called L. Spica Linnæus; and that the taxon in the past called L. Spica by many authors should bear the name L. latifolia Villars.

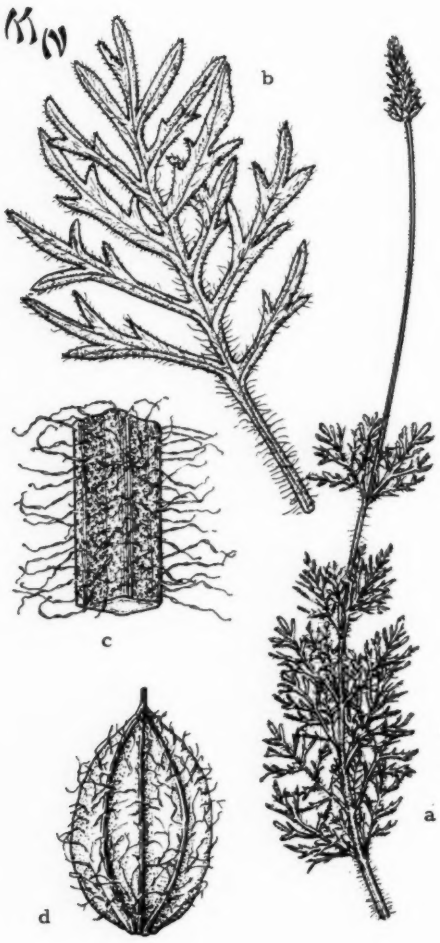


Fig. 19. Lavandula multifida: a, habit x 2/5; b, leaf x 2; c, section of stem x 8; d, floral bract x 6.

The three species in this section are superficially quite similar, but careful examination shows a number of constant differences. Lavandula lanata Boissier (fig. 18C) is immediately distinguished by its 8-nerved, 8-toothed calyx. In addition, it is much woollier than the other two species.

Lavandula Spica Linnæus and L. latifolia Villars may be more difficult to distinguish. Nevertheless, L. Spica is readily recognized by the more or less rhombic floral bracts (fig.17c) and the narrow leaves, to 6 mm. wide (fig.17b). Also, the peduncles are usually not branched. Lavandula latifolia has linear or almost subulate floral bracts (fig. 18Db), the leaves are broader, to 10 mm. wide (fig. 18Da), and the peduncles are frequently branched. These two species do hybridize, and the fancy—named varieties of lavender which I have seen seem to fall in the category of hybrids, for which the correct botanical name is L. × intermedia Emeric ex Loiseleur.

The true lavender, L. Spica Linnæus (L. vera DeCandolle, L. officinalis Chaix) (fig. 17),

is the lavender of the perfume trade and of gardens. It has been cultivated for several hundreds of years, during which time several cultivars have been recognized, probably produced by hybridization with L. latifolia. As noted above, the fancy-named varieties available in this country, such as 'Waltham' and 'Dutch', seem to fall in this category. A variety, L. Spica var. angustifolia Rouy and Foucaud, is distinguished on the basis of the shorter peduncles (5 - 8 cm. long, as compared with the typical variety in which the peduncles are 15 - 20 cm. long) and narrower leaves. This probably includes all those cultivars having "nana," "compacta," or "dwarf" in their names, and also material offered as "L. præcox." A second variety, L. Spica var. delphinensis Rouy and Foucaud, is distinguished on the basis of the longer peduncles which average more than 20 cm. long. Finally, a third variety, L. Spica var. pyrenaica Bentham, is distinguished by the large floral bracts, which are about as long as the subtended calyces. I have seen a specimen, taken from cultivated material labelled L. serrata, which appears to be referable to this last variety.

Lavandula latifolia Villars (fig. 18D), or spike lavender, produces the oil of spike which, while inferior to true oil of lavender for perfumery, is much used in the manufacture of soaps. Besides the purely morphological characters mentioned above, this species differs from L. Spica in the chemical composition of the oil and in its natural habitat. Lavandula Spica is a plant which grows naturally at altitudes of from 700 - 1,000 meters, while L. latifolia grows

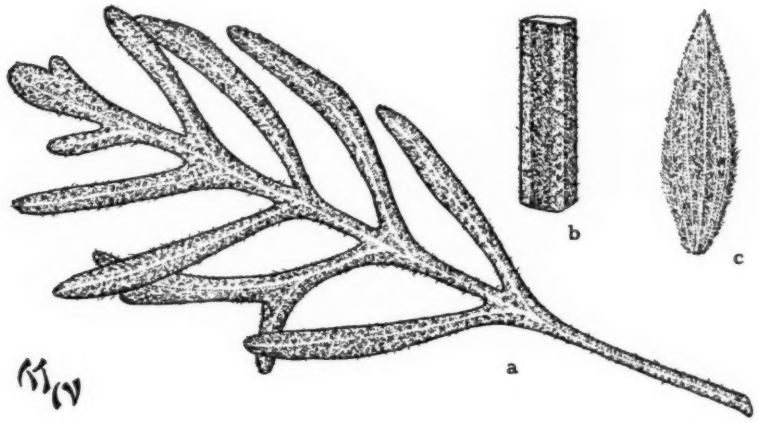


Fig. 20. Lavandula pinnata: a, leaf x 2; b, section of stem x 8; c, floral bract x 6.

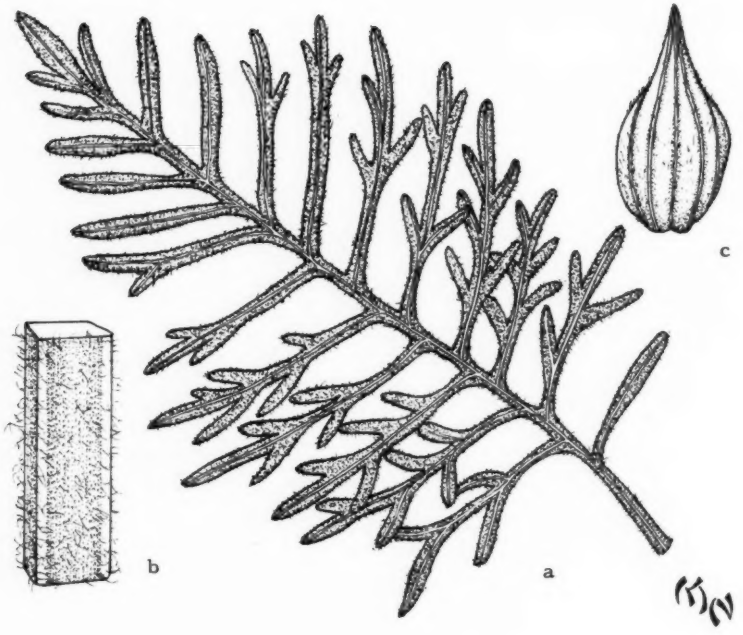


Fig. 21. Lavandula canariensis: a, leaf x 2; b, section of stem x 8; c, floral bract x 6.

at elevations below 700 m. The hybrid, L. × intermedia Emeric ex Loiseleur, is intermediate between the two parent species in its characters. Due to its easier culture, its oil, though inferior to the oil of L. Spica, is finding wide use in the manufacture of toiletries.

Section PTEROSTOECHAS

Three species of this section may occasionally be met with in cultivation. Lavandula pinnata Linnæus filius (fig. 20) is readily distinguished by its generally simply pinnate leaves, which are much coarser than those of either of the other two species.

Lavandula canariensis Miller (fig. 21) and L. multifida Linnæus (fig. 19) are superficially similar in appearance, but may be readily distinguished by the long hairs of L. multifida which are lacking in L. canariensis. Lavandula canariensis is native in the Canary Islands, while L. multifida is native to the Mediterranean region.

Miss Neugebauer has sent in specimens of what appears to be L. pubescens Decaisne. This species is related to L. canariensis, but is distinguished from it by the shape of the posterior calyx teeth, which are deltoid and almost equal in L. canariensis, but are ovate to lanceolate, with the median tooth broader, in L. pubescens. The latter is native to southern Asia Minor and northeastern Africa.

None of these species seems to be significant economically. They will probably be cultivated only by specialists.

Section CHAETOSTACHYS

The only material of this section that I have seen is a specimen of L. bipinnata Kuntze cultivated by Miss Neugebauer. This is an herbaceous species, native to India. It does not seem to have economic significance.

ERICA BAUERA GROWN AS E. BOWIEANA

Erica enthusiasts, and especially those of southern California, are familiar with a low shrub having large white flowers, known in the trade and much of the literature as Erica Bowieana. This name, given it by Loddiges in his "Botanical Cabinet" in 1824, was adopted by Guthrie and Bolus in their account of the genus in the classical "Flora Capensis" (vol. 4, p. 54, 1905).

It has recently been pointed out by Dr. Turrill at Kew that this same species was described and figured by Andrews twelve years previously, in his monograph of the genus, under the name Erica Bauera (see "Curtis's Botanical Magazine," vol. 170, pl. 222, 1954). It was named by Andrews in honor of Franz Bauer, an Austrian botanical artist in the employ of Sir Joseph Banks of London. Dr. Turrill has shown that the characters used in the key in "Flora Capensis" fit the plant, but that they contradict the description. This change in name will be adopted in "Hortus III."

G. H. M. L.

A Double-flowered Rosa carolina[1]

Doris Lynes, Taberg, N. Y.

An account of the rediscovery and the introduction to gardens of a long-lost double-flowered wild rose has been prepared for publication in the 1955 Annual of the American Rose Society. Careful study of this rose shows it to be Rosa carolina, but equally careful check of the literature fails to reveal its name having been properly published under this binomial.

Humphrey Marshall in 1785 wrote of four native American roses known to him. The last two of these he called "Rosa humilis, Dwarf Pennsylvanian Rose," and "Rosa pennsylvanica plena, Double Pennsylvanian Rose." Of the double-flowered variant, he wrote, "This very much resembles the last described [R. humilis] in growth and appearance, except in having a double flower."

For the last century or so, botanists have agreed that Marshall's Rosa humilis is a synonym of the plant Linnæus named Rosa carolina. No double-flowered variety of R. carolina is cited in the available literature, including the leading rose monographs, American botanical works, and Rehder's "Bibliography of Cultivated Trees and Shrubs" (1949). In view of the rediscovery of the plant, and of this nomenclatural situation, the following new combination is made:

Rosa carolina var. plena (Marshall) Doris Lynes, comb. nov., Rosa pennsylvanica plena Marshall, Arbustrum Americanum, p. 136, 1785.

In making this combination, I am aware that Humphrey Marshall did not designate the category of variety for his plena, and I am also aware of my inability to cite a place where the plant now grows wild. It was Marshall's practice to cite locations for plants included in his book when they were rarities or when they were restricted to a particular region. His omission of a locality for this rose might indicate that it was neither rare nor restricted in distribution. Many contemporary floras ignore double-flowered variants and the omission of this plant may be due to this reason or, more likely, to its disappearance as an indigenous element by virtue of its sterility.

[1]In the study of this matter, and in the preparation of this note for publication, I have been assisted by Dr. George Lawrence of the Bailey Hortorium staff.

On the Gender of Scientific Plant Names

William J. Dress

In this day, when the study of Latin and Greek has become an esoteric pastime, and a familiarity with even a single modern foreign language is not the rule, American horticulturists are often puzzled by the presence of, and the rules governing, gender in the scientific names of plants. Modern English itself retains little trace of it, so even the very concept of grammatical gender may seem strange to those who speak and read only English. However, it must be admitted that even the professional taxonomist familiar with Latin is occasionally confronted with a real, though minor, problem in having to determine the gender of a generic name.

Most modern scientific names are derived directly from Latin words or from latinizations of Greek words, and, since gender is an integral element of the grammar of both Latin and Greek (as well as of many modern languages), it is also an integral element of these scientific names. In Latin, three genders are distinguished - masculine, feminine, and neuter - and all nouns are considered to fall into one of these three categories. The gender of nouns, furthermore, is either "natural" or "grammatical." Natural gender indicates the actual sex of the object denoted by the noun: "vir" (man) and "equus" (horse) are both male, and therefore grammatically masculine; "femina" (woman) and "equa" (mare) are female, and therefore grammatically feminine. Grammatical gender, on the other hand, is only a formal distinction as to sex, in objects where no sex actually exists: "mensa" (table) is a feminine noun; "mons" (mountain) is masculine; "flumen" (river) is neuter. For convenience, the terms "masculine," "feminine," and "neuter" will frequently herein be abbreviated to "m.," "f.," and "n." respectively.

Now, the name of a genus of plants is always a noun, and, as such, must have gender. Generic names which are words borrowed directly from Latin or, in Latin form, from Greek (whether or not originally used as names of plants) retain the gender which was assigned to them by the ancients (e.g., Thalia [f.], Umbilicus [m.], Rhododendron [n.]). Most generic names, however, are modern compounds, formed from two or more Latin or Greek words, and in their present form were unknown in classical use. Such compounds assume the gender of their last component word (e.g., Helianthemum [n.], from the Greek words "helios" [m.], meaning "sun," and "anthemon" [n.], "flower").

A third group of names includes those taken from the names of persons living in relatively recent times (i.e., not mythological beings or actual persons of classical times). These are ordinarily formed by adding "-a" or "-ia" to the personal name, and are considered feminine, whether honoring a man or woman (e.g., Gaultheria [f.], named for a Dr. Gaultier; Strelitzia [f.], for Queen Charlotte Sophia, of the house of Mecklenburg-Strelitz).

Still other names may be taken or derived from languages other than Greek or Latin (e.g., Manihot [f.], from the native Brazilian vernacular; Pimenta [f.] and Sassafras [n.], from the Spanish; Vanda [f.], from the Sanskrit). These are often called "barbaric" names, because the term "barbarus," as used by the Romans, meant "foreign." It is interesting to note that the Romans applied this originally Greek term to anything or anyone not Roman or Greek, whereas the Greeks always included even the Romans within its meaning.

The name of a genus may also be formed in an arbitrary manner (e.g., Lobivia [f.], an anagram of Bolivia; Trilisa [f.], an anagram of [the genus] Liatris). Neither the barbaric names nor such contrived names have any prescribed gender in Latin, of course; when thus used as generic names, they are treated as though they were good Latin, however, and the original author of each name is privileged to ascribe to it the gender he chooses. When he has failed to indicate any gender for it, the choice of the next subsequent author who does do so should be accepted.

Now, the name of any species is a binomial - that is, it consists of two words (e.g., Lilium tigrinum); the first is the generic name, the second is the specific epithet. I have already pointed out that the generic name is a noun with a definite gender assigned to it. The specific epithet is either another noun or an adjective, modifying or describing the generic name. (Whatever may be said here concerning the specific epithet will apply equally to any subspecific epithet, also - whether in the category of subspecies, variety, or form, or even of a cultivar, so long as it is a Latin and not a vernacular name.)

When the epithet is a noun, it may stand in apposition to the generic name, like an attributive noun in English (e.g., Begonia rex, the "King Begonia"; Campanula Saxifraga, the "Saxifrage Campanula" [because of its resemblance to a saxifrage]); or, it may be a noun (frequently the name of a person) in the genitive - equivalent to the English possessive - case (e.g., Gaultheria Hookeri, "Mr. Hooker's Gaultheria"; Ramonda Nathaliæ, "Natalia's Ramonda"; Rosa dumetorum, "Rose of the thickets"). Such possessive nouns usually terminate in one of the following inflections: -æ, -iæ, -i, -ii, -is, -arum, -orum, -ium (-um). Whether in apposition, or in the possessive, such words, being nouns, have their own gender independent of that of the generic name, and therefore in no way indicate the gender of the latter. It is in this way that many apparent-

ly ill-assorted combinations (in respect to gender) occur, such as Arctium Lappa, Cypripedium Calceolus, Liriodendron Tulipifera, Sedum Rosea. In each of these instances, the gender of the specific epithet is different from that of the generic name; old pre-Linnæan names, once used as generic names, have here been made to serve as specific epithets.

When the specific epithet is an adjective, the termination of that word changes according to the gender of the generic name with which it is coupled; in Latin, an adjective always "agrees" in gender with the noun which it modifies or describes. The adjective "albus" (white) may be used to illustrate the variation in form which the specific epithet may undergo when it is used in genera of different genders: Rosa [f.] alba, Hyoscyamus [m.] albus, Allium [n.] album. In these examples, the termination of the specific epithet in each instance happens to be the same (-a, -us, -um) as that of the noun (generic name) it modifies. However, "alba," "albus," and "album" are respectively the feminine, masculine, and neuter forms of this word and remain so even though the generic names with which they are associated do not also have the endings "-a," "-us," and "-um." Thus, we have the combinations Lychnis [f.] alba, Aster [m.] albus, Rhododendron [n.] album.

Latin adjectives as a group have almost as great a variety of possible terminations or endings as do the nouns, though each one is constant in so far as its own masculine, feminine, and neuter forms are concerned. In some instances, there may be no difference between the masculine and feminine forms, and in some others the form is the same for all three genders. The following will exemplify these various sorts and serve as models for the inflection (variation from gender to gender) of similar adjectives.

Masculine	Feminine	Neuter	Similarly varying adjectives
albus	alba	album	alpinus, americanus, glaucus, nanus, pauciflorus, et al.
niger	nigra	nigrum	glaber, pulcher, ruber, scaber, et al.
miser	misera	miserum	asper, glandulifer, setiger, tener, et al.
acer	acris	acre	campester, paluster, silvester, terrester, et al.[1]
lævis	lævis	læve	acaulis, gracilis, linearis, mollis, tenuis, vulgaris, et al.
atrox	atrox	atrox	adsurgens, bicolor, nigricans, simplex, thujoides, et al.
elatior	elatior	elatius	durior, latior, minor, et al.

An adjectival specific epithet, then, reflects and frequently reveals the gender of the generic name. In Cloris barbata, the feminine ending of "barbata" indicates that "Cloris" is a feminine name, for example; Penstemon ovatus and Muscari comosum are similarly revealed as masculine and neuter names, respectively. Adjectives which do not vary in form (e.g., atrox, ingens) are of no help as gender-indicators, of course.

[1] Some of these have alternate masculine forms (e.g., silvestris, terrestris) and then are similar to "lævis" in their variation.

Apart from actually learning by rote or from experience the genders of individual plant names, one may be guided by certain general rules for determining the grammatical gender of Latin nouns. Exceptions to such rules are numerous, however, and not always reasonably explained. Neither all the rules nor all the exceptions can be practically set forth here, but those offered should help anyone who knows "little Latin and less Greek" to acquire at least a feeling for the subject of grammatical gender.

Feminine names.

Generic names ending in "-a" and "-e" are usually feminine (e. g., Campanula, Silene). However, a group of names ending in "-ma," and, in particular, those ending in "-derma," "-nema," "-sperma," "-stemma," "-stigma," "-stoma," are of Greek derivation, and are neuter (e. g., Æthionema, Dierama, Eustoma); however, even some Greek roots ending in "-ma," like "-gramma" and "-osma," are feminine (e.g., Cryptogramma, Onosma). Plant names terminating in "-is" are almost invariably feminine (e. g., Crepis, Nomocharis); even Hemerocallis, which really is not, "should also be treated as feminine in order to bring it into conformity with all other generic names ending in '-is'," according to the present code of nomenclature. Names with terminations such as "-as," "-es," "-ops," and "-x" will also usually prove to be feminine, but exceptions are numerous. A few names (and consequently, their compounds, also), whose classical gender is masculine, should now be treated as feminine to conform to historic usage: Adonis, Orchis, Stachys, Diospyros, and Strychnos.

Maculine names.

Modern compound names ending in "-us (-os)" are, as a rule, masculine (e. g., Hermodactylus, Pleiospilos). Even compounds ending in "-anthus (-anthos)" and "-chilus (-chilos)" (e. g., Chionanthus, Dianthus, Lissochilus), which are Greek neuter nouns, "have been with very few exceptions treated as masculine [in the past], hence it is recommended to assign that gender to them," to quote the recommendations of the International Code of Botanical Nomenclature. Some original Latin plant-names ending in "-us" are also masculine[1], but the majority are feminine in gender[2], in spite of the ordinarily characteristically masculine termination. This apparent anomaly exists because names of plants were usually considered feminine by the ancients, though exceptions to the general rule occur.

[1] Some of importance horticulturally are: Acanthus, Amaranthus, Crocus, Daucus, Helleborus, Hyacinthus, Juncus, Lupinus, Phaseolus, Raphanus, Ricinus, Rosmarinus, Rubus, Zizyphus.

[2] The more common are: Æsculus, Alnus, Arbutus, Buxus, Carpinus, Cedrus, Cissus, Citrus, Cornus, Corylus, Cupressus, Dictamnus, Elæagnus, Euonymus, Fagus, Ficus, Fraxinus, Hyssopus, Juniperus, Laurus, Malus, Melilotus, Mespilus, Morus, Myrtus, Pinus, Platanus, Populus, Prunus, Pyrus, Quercus, Rhamnus, Sambucus, Syagrus, Taxus, Ulmus. Compounds terminating in these names (e. g., Cephalotaxus, Nothofagus) are feminine also.

Neuter names.

The commonest word-endings which can rather surely be expected to indicate a neuter name are "-um" and "-on." However, compound words ending in the Greek terms "-pogon," "-codon," "-odon," "-stemon" (e.g., Andropogon, Platycodon, Penstemon), and a few others such as Erigeron, are masculine; but, those ending in "-mecon," meaning "poppy" (e.g., Dendromecon), are feminine. Latin names (of plants) ending in "-er" are generally neuter also; those most likely to be encountered are Acer, Cicer, Papaver, Piper, and Zingiber (Amelanchier [f.] is of "barbaric" origin, not original Latin). Neuter names are also to be found among those ending in "-ma," as is noted in the discussion of feminine endings.

No really workable generalizations can be made for generic names having terminations other than those already noted - the genders of such names must be learned by practice and by consulting reliable authorities. Unfortunately, the reliability of many otherwise trustworthy texts is only relative in the matter of grammatical gender; even the most revered taxonomists, past and present, have occasionally gone astray in this tangled forest. Some names and name-elements have been so consistently assigned an incorrect gender, in fact, that the International Code of Botanical Nomenclature recommends that certain of these continue to be so treated, "in accordance with botanical custom" or "historical usage." Such of these which apply to commonly cultivated plants have been mentioned above.

The basonym of the combination Calamintha glabella (Michaux) Bentham var. angustifolia (Torrey) DeWolf is Micromeria glabella (Michaux) Bentham var. angustifolia Torrey, Flora of New York, vol. 2, page 67 (1843), not Satureja glabella (Michaux) Briquet var. angustifolia (Torrey) Svenson, as stated in "Baileya," vol. 2, page 150.

This issue of "Baileya" is the product of a new editor, Dr. William J. Dress, a member of the Bailey Hortorium staff, whose editorial talents have contributed materially to many of the previous issues of this publication.

In Dr. Dress the Bailey Hortorium is fortunate in having a person with a background in classical languages, a broad field knowledge of native flora of this country, and an enthusiasm for knowing the kinds of cultivated plants in the garden and conservatory. He is a native of Buffalo, New York, and received his Doctor's degree in Botany from Cornell in 1953.

G. H. M. L.

ERRATA, VOLUMES 1 AND 2

VOLUME 1

Page 113, line 32: for "last" read "first."

VOLUME 2

Page 39, line 14 of key: for "11.5 cm." read "1-1.5 cm."

Page 42, line 27: for "bisect" read "violet."

line 30: for "fig. 00" read "fig. 13."

immediately following line 25: a line omitted should read "irregularly crosswise between the veins (fig. 14)."

Page 44, line 17: for "Lindeh" read "Linden."

Page 45, legend of Fig. 14: add "adapted from Flores des Serres 16: t. 1711-1712."

Page 46, line 19: for "Caffea" read "Coffea."

Page 47, line 31 of text: insert "β." before "crinitus."

Page 57, line 16 of text: for "and" read "et."

Page 59, lines 4 and 19: for "Gleditch" read "Gleditsch."

line 7: for "Fig. 23b" read "Fig. 22B."

line 15: for "Origanum Marjorana" read "Origanum Majorana."

line 24: for "described" read "describendi."

line 31: for "tomentosa" read "tomentosus."

Page 62, line 43: for "Marjorana" read "Majorana."

Page 64, legend of Fig. 22, line 1: for "Orignaum" read "Origanum."

line 2: for "Ac, spikule" read "Ac, cymule."

Page 65, legend of Fig. 23: for "Origanum Onites" read "Majorana Onites."

Page 81, line 29: for "Aichinsonii" read "Aichisonii."

Page 82, line 26: for "18. C. longiflorus" read "18. C. longiflorus var. longiflorus."

Page 82, line 28: for "19. C. niveus" read "18a. C. longiflorus var. melitensis."

line 32: this lead should terminate with the species "19. C. niveus."

Page 83, lines 37 and 42; and page 85, lines 7 and 8: for "Karduchorum" read "karduchorum."

Page 85, line 12: for "Chaubaud" read "Chaubard."

line 32: for "Biebersteinii" read "Bieberstein."

line 37: "zonatus" should not be underscored.

Page 88, ENDINGS OF SOME LATIN NAMES: wherever the letter "r" is mentioned, substitute the letters "er."

Page 88, lines 30 and 31: for "Davidii vs. Davidii" read "Davidii vs. Davidi."

Page 89, line 5 of text: for "reason" read "season."

Page 93, line 4 of key: insert ";" after "fine."

line 5 of key: insert ";" after "shoots."

Page 95, line 2: for "supernumary" read "supernumerary."

line 6: insert "," after "spreading."

line 17: for "mostly 5. pinnate" read "mostly of 5 leaflets."

Page 97, line 17 of text: after "Gentes Herbarum 8:" add "380-383 (1954)."

Page 99, line 21 of text: for "fig. 00B" read "fig. 31B."

Page 102, line 31: the headings of the table listing the distinguishing characters of the two clones should be interchanged; i.e., the left column should be headed "Sugar Maple 'Temple's Upright' (fig. 31A)," and the right column "Sugar Maple 'Newton Sentry' (fig. 31B)."

Page 108, line 22: for "figs. 33s, t, u" read "figs. 33S, T, U."

Page 109, line 20 of key: for "vermicorm" read "vermiform."

line 25 of key: delete "," after "sheathing"; insert "," after "scape."

Page 111, legend of Fig. 34, line 2: for "habit of flowering and after flowering" read "habit before flowering and at flowering."

line 3: for "habit x 1/3 and flower x 1" read "habit x 1/5 and flower x 2."

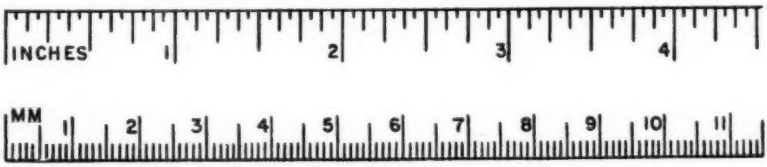
Page 124, line 12: for "Henry Saier" read "Harry Saier."

Page 136, line 4: for "clones [6, 31]" read "clones [6, 32]."

ABBREVIATIONS USED IN BAILEYA

[Excluding abbreviations of author's names following binomials etc.]

ann.	annual	dm.	decimeter	lf.	leaf
bien.	biennial	fl.	flower	lft.	leaflet
br.	branch	fls.	flowers	lvs.	leaves
brt.	branchlet	flt.	floret	mm.	millimeter
caps.	capsule	fr.	fruit	per.	perennial
cl.	clone	ft.	foot	segm.	segment
cm.	centimeter	hort.	horticultural	st.	stem
cv.	cultivar	in.	inch	sts.	stems
diam.	diameter	infl.	inflorescence	var.	variety

METRIC - ENGLISH EQUIVALENTS (approximate)

6 mm. - 1/4 in.	10 cm. - 4 in.	10 mm. - 1 cm.
12 mm. - 1/2 in.	1 dm. - 4 in.	10 cm. - 1 dm.
25 mm. - 1 in.	3 dm. - 1 ft.	10 dm. - 1 meter
2.5 cm. - 1 in.	10 dm. - 1 yd.	
5 cm. - 2 in.	1 m. - 39 in.